OM-222H November 1997

Eff. w/Serial Number KH537589

Processes

TIG (GTAW) Welding

Stick (SMAW) Welding

Flux Cored (FCAW) Welding

Air Plasma Cutting and Gouging

Air Carbon Arc (CAC-A) Cutting and Gouging

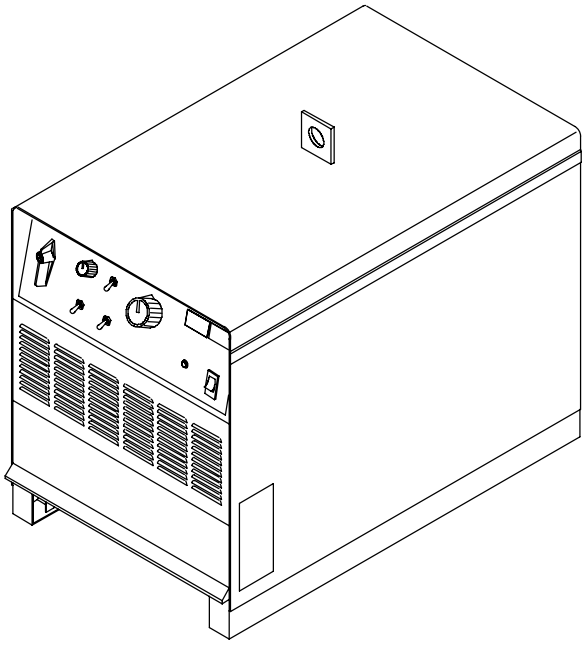
Description

CC DC 3 Phase

Arc Welding Power Source

CE

Gold Star® Series



302, 452, 652 (60 Hz), 402, 602, 852 (50/60 Hz)

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www.Miller-Welds.com

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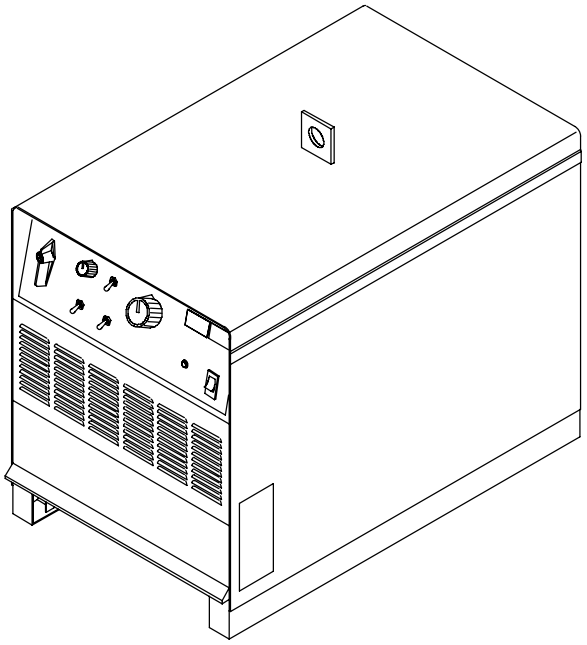

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Effective January 1, 1997
(Equipment with a serial number preface of "KH" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Robots
   * Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
   * Motor Driven Guns (w/exception of Spoolmate 185)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * Orbital Weld Heads
   * IHPS Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * SDX Transformers
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT, ZIPCUT & PLAZCUT Models)
   * Deutz Engines (outside North America)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts and Labor
   * MIG Guns/TIG Torches
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate 185

Miller's True Blue® Limited Warranty shall not apply to:

1. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

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Service
You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

Support
Need fast answers to the tough welding questions? Contact your distributor. The expertise of the distributor and Miller is there to help you, every step of the way.

Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.

For practical information on welding, process applications, and Miller products, visit our website at

www.miller-welds.com

The following terms are used interchangeably throughout this manual:
TIG = GTAW
Stick = SMAW

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Declaration of Conformity For European Community (CE) Products

NOTE ☞	*This information is provided for units with CE certification (see rating label on unit.)*

Manufacturer's Name: Miller Electric Mfg. Co.

Manufacturer's Address: 1635 W. Spencer Street
Appleton, WI 54914 USA

Declares that the product: **Goldstar® 402, 602, And 852**

conforms to the following Directives and Standards:

Directives

Electromagnetic compatibility Directives: 89/336/EEC, 92/31/EEC

Low Voltage Directive: 73/23/EEC

Machinery Directives: 89/392/EEC, 91/368/EEC, 93/C 133/04, 93/68/EEC

Standards

Safety Requirements for Arc Welding Equipment part 1: EN 60974-1: 1990

Arc Welding Equipment Part 1: Welding Power Sources: IEC 974-1
(April 1995 – Draft revision)

Degrees of Protection provided by Enclosures (IP code): IEC 529: 1989

Insulation coordination for equipment within low-voltage systems:
Part 1: Principles, requirements and tests: IEC 664-1: 1992

Electromagnetic compatibility (EMC) Product standard for arc welding equipment:
EN50199: August 1995

European Contact: Mr. Luigi Vacchini, Managing Director
MILLER Europe S.P.A.
Via Privata Iseo
20098 San Giuliano
Milanese, Italy

Telephone: 39(02)98290-1
Fax: 39(02)98281-552

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section NO TAG. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable – do not use work clamp or work cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

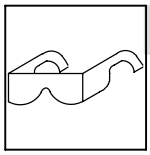
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.

MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

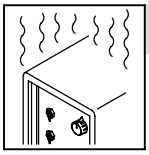
1-3. Additional Symbols for Installation, Operation, and Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

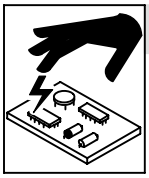
FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can cause injury.

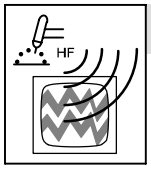
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard." However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 1 – CONSIGNES DE SECURITE – LIRE AVANT UTILISATION

1-1. Signification des symboles

Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ **Identifie un message de sécurité particulier.**

☞ *Signifie NOTA ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

1-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-5. Veuillez lire et respecter toutes ces normes de sécurité.**

▲ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.**

▲ **Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.**

UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct – ne pas utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

Il y a DU COURANT CONTINU IMPORTANT dans les convertisseurs après la suppression de l'alimentation électrique.

- Arrêter les convertisseurs, débrancher le courant électrique, et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie entretien avant de toucher les pièces.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- A l'intérieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

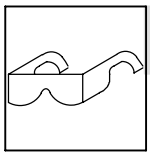
Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (cuir ou laine) et une protection des pieds.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



DES PARTICULES VOLANTES peuvent blesser les yeux.

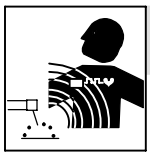
- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher des parties chaudes à mains nues
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.

Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publications P-1 CGA énumérées dans les normes de sécurité.

1-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

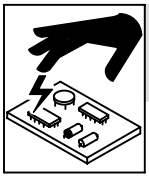
- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces infllammables.
- Ne pas installer l'appareil à proximité de produits inflammables
- Ne pas surcharger l'installation électrique – s"assurer que l'alimentation est correctement dimensionné et protégé avant de mettre l'appareil en service.

LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariot, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un engin d'une capacité appropriée pour soulever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.

L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement, respecter le cycle opératoire nominal.
- Réduire le courant ou le cycle opératoire avant de recommancer le soudage.
- Ne pas obstruer les passages d'air du poste.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

DES ORGANES MOBILES peuvent provoquer des blessures.

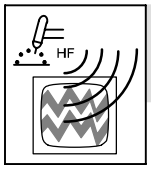
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gachette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.

DES ORGANES MOBILES peuvent provoquer des blessures.

- Rester à l'écart des organes mobiles comme le ventilateur.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute frequence peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et et un blindage pour réduire les interférences éventuelles.

LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

1-4. Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

Safety and Health Sandards, OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

National Electrical Code, NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

L'extrait suivant est tiré des conclusions générales du document intitulé *Biological Effects of Power Frequency Electric & Magnetic Fields – Background Paper, OTA–BP–E–53 (Washington DC : U.S. Government Printing Office, mai 1989)*, publié par le Office of Technology Assessment du Congrès américain : «... il existe maintenant d'abondantes données scientifiques compilées à la suite d'expériences sur la cellule ou d'études sur des animaux et des humains, qui montrent clairement que les champs électromagnétiques basse fréquence peuvent avoir des effets sur l'organisme et même y produire des transformations. Même s'il s'agit de travaux de très grande qualité, les résultats sont complexes. Cette démarche scientifique ne nous permet pas d'établir un tableau d'ensemble cohérent. Pire encore, elle ne nous permet pas de tirer des conclusions finales concernant les risques éventuels, ni d'offrir des conseils sur les mesures à prendre pour réduire sinon éliminer les risques éventuels». (Traduction libre)

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.

2 Mettre tous les câbles du côté opposé de l'opérateur.

3 Ne pas courber pas et ne pas entourer pas les câbles autour de vous.

4 Garder le poste de soudage et les câbles le plus loin possible de vous.

5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

Les consignes mentionnées précédemment font partie de celles destinées aux personnes ayant recours à un stimulateur cardiaque. Veuillez consulter votre médecin pour obtenir plus de détails.

SECTION 2 – DEFINITIONS

2-1. General Precautionary Label

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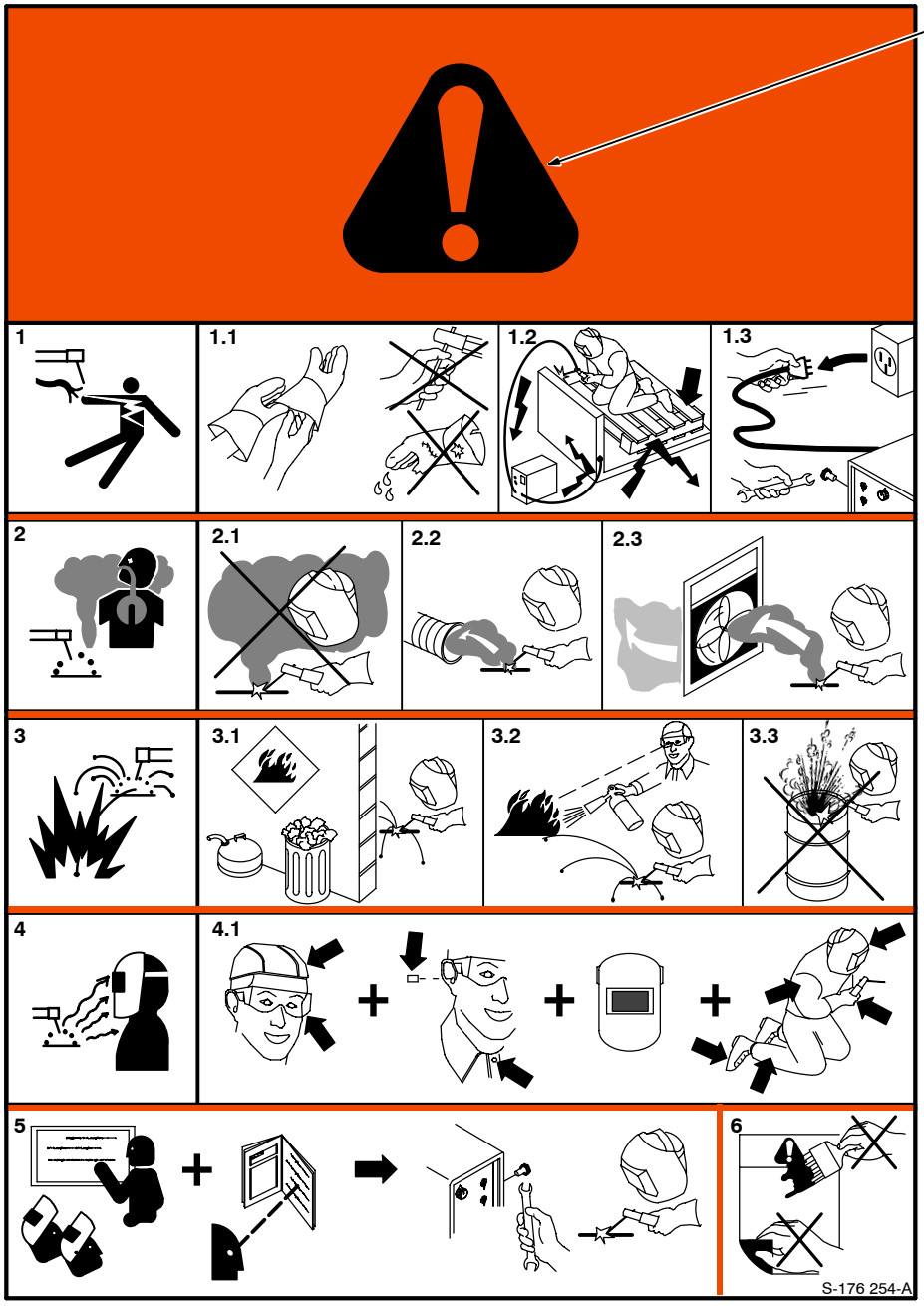


Warning! Watch Out! There are possible hazards as shown by the symbols.

1 Electric shock from welding electrode or wiring can kill.

1.1 Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.

1.2 Protect yourself from electric shock by insulating yourself from work and ground.

1.3 Disconnect input plug or power before working on machine.

2 Breathing welding fumes can be hazardous to your health.

2.1 Keep your head out of the fumes.

2.2 Use forced ventilation or local exhaust to remove the fumes.

2.3 Use ventilating fan to remove fumes.

3 Welding sparks can cause explosion or fire.

3.1 Keep flammables away from welding. Do not weld near flammables.

3.2 Welding sparks can cause fires. Have a fire extinguisher nearby, and have a watchperson ready to use it.

3.3 Do not weld on drums or any closed containers.

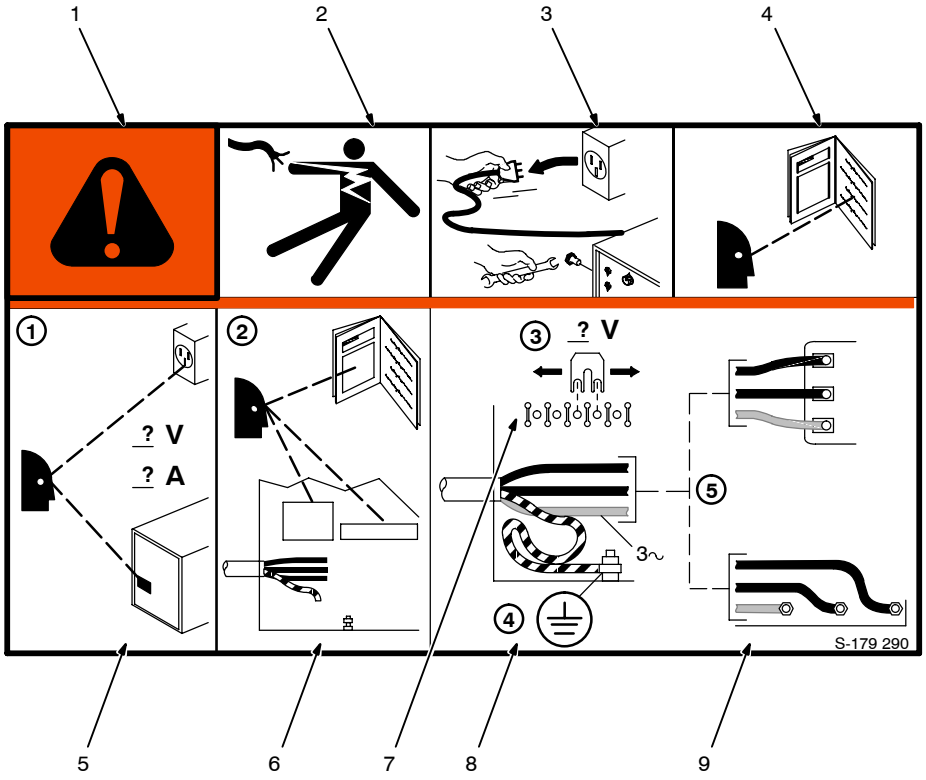
4 Arc rays can burn eyes and injure skin.

4.1 Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection.

5 Become trained and read the instructions before working on the machine or welding.

6 Do not remove or paint over (cover) the label.

2-2. Input Connection Label



1 Warning! Watch Out! There are possible hazards as shown by the symbols.
2 Electric shock from wiring can kill.
3 Disconnect input plug or power before working on machine.
4 Read the Owner's Manual before working on this machine.
5 Consult rating label for input power requirements, and check power available at the job site – they must match.
6 Read Owner's Manual and inside labels for connection points and procedures.
7 Move jumper links as shown on inside label to match voltage at job site.
8 Having a loop of extra length, connect grounding conductor first.
9 Connect line input conductors as shown on inside label – double-check all connections, jumper link positions, and input voltage before applying power.

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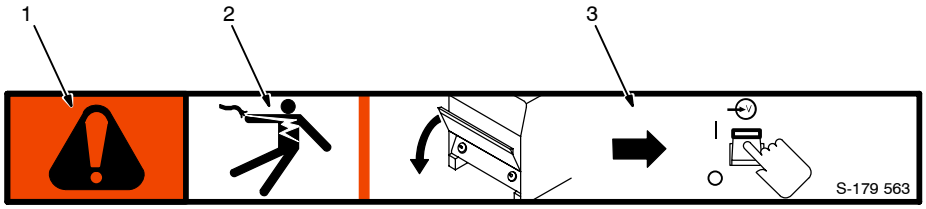
2-3. Electric Shock And Airflow Label



1 Warning! Watch Out! There are possible hazards as shown by the symbols.
2 Electric shock from wiring and exposed weld terminals can kill.
3 Close door before turning on unit.

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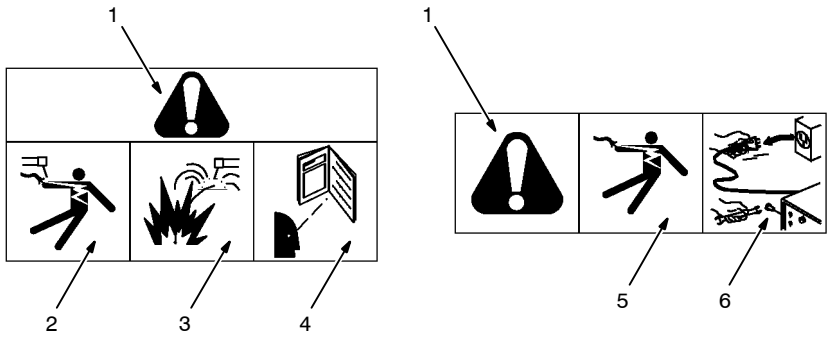
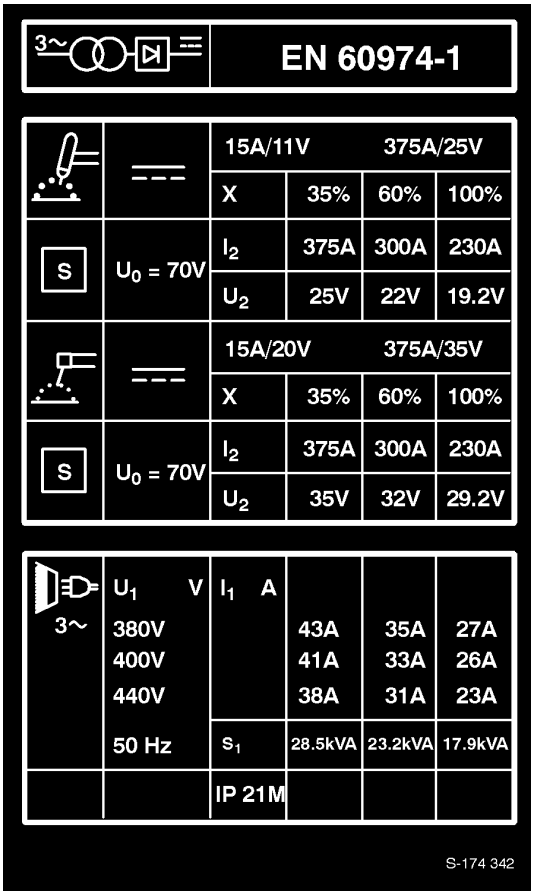
2-4. Nameplate Safety Symbols



1 Warning! Watch Out! There are possible hazards as shown by the symbols.
2 Electric shock from welding electrode or wiring can kill.
3 Sparks from arcing electrode can cause explosion or fire – disconnect cable for process not in use.
4 Read Owner's Manual for connection procedures.
5 Electric shock from wiring can kill.
6 Disconnect input power before working on unit or making terminal strip connections.

Nameplate D-179 389

2-5. Manufacturer's Rating Labels For CE Products



3~	EN 60974-1				
		15A/11V			375A/25V
		X	35%	60%	100%
S	U_0 = 70V	I_2	375A	300A	230A
		U_2	25V	22V	19.2V
		15A/20V			375A/35V
		X	35%	60%	100%
S	U_0 = 70V	I_2	375A	300A	230A
		U_2	35V	32V	29.2V
3~	U_1 V	I_1 A			
	380V		43A	35A	27A
	400V		41A	33A	26A
	440V		38A	31A	23A
	50 Hz	S_1	28.5kVA	23.2kVA	17.9kVA
		IP 21M			

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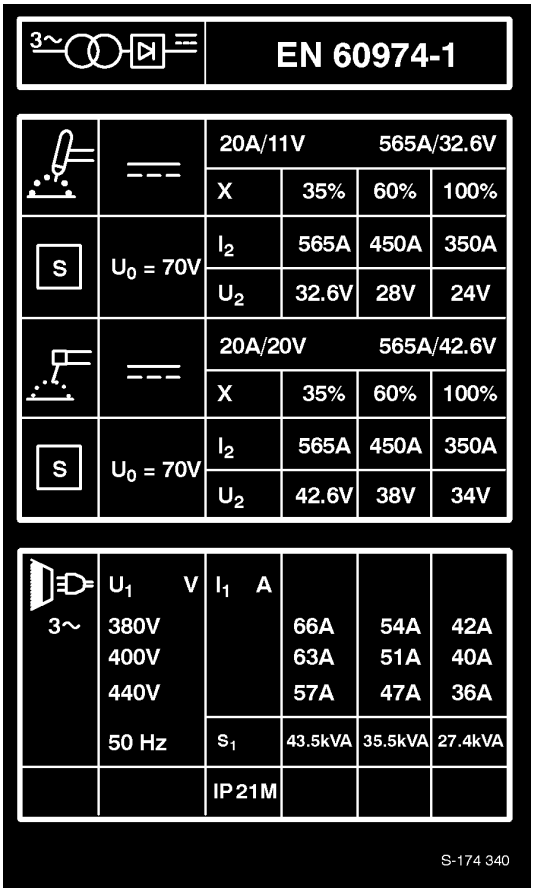
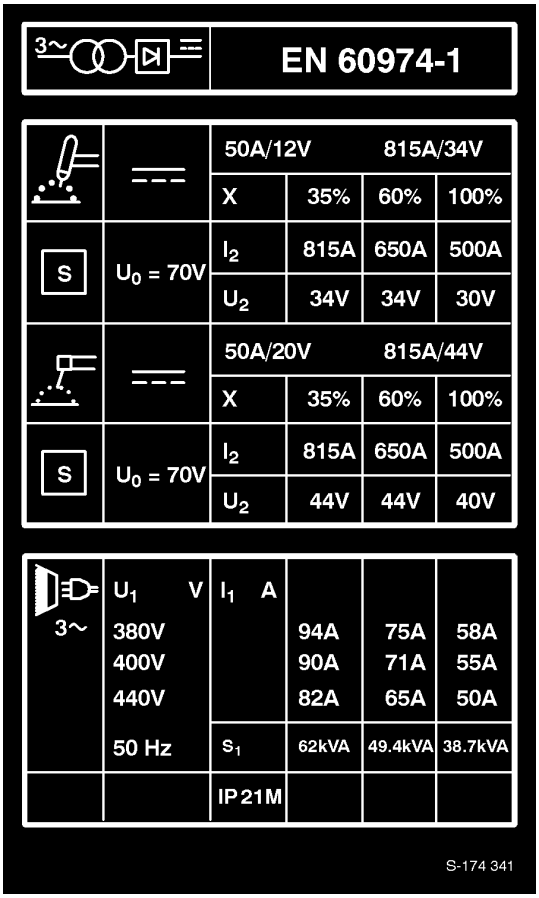


3~	EN 60974-1				
		20A/11V			565A/32.6V
		X	35%	60%	100%
S	U_0 = 70V	I_2	565A	450A	350A
		U_2	32.6V	28V	24V
		20A/20V			565A/42.6V
		X	35%	60%	100%
S	U_0 = 70V	I_2	565A	450A	350A
		U_2	42.6V	38V	34V
3~	U_1 V	I_1 A			
	380V		66A	54A	42A
	400V		63A	51A	40A
	440V		57A	47A	36A
	50 Hz	S_1	43.5kVA	35.5kVA	27.4kVA
		IP 21M			

S-174 340



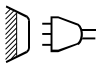
3~	EN 60974-1				
		50A/12V			815A/34V
		X	35%	60%	100%
S	U_0 = 70V	I_2	815A	650A	500A
		U_2	34V	34V	30V
		50A/20V			815A/44V
		X	35%	60%	100%
S	U_0 = 70V	I_2	815A	650A	500A
		U_2	44V	44V	40V
3~	U_1 V	I_1 A			
	380V		94A	75A	58A
	400V		90A	71A	55A
	440V		82A	65A	50A
	50 Hz	S_1	62kVA	49.4kVA	38.7kVA
		IP 21M			

S-174 341

☞ *Match label to one on unit. See Section 3-4.*

2-6. Symbols And Definitions

Note ☞ *Some symbols are found only on CE products.*

A	Amperes		Amperage Control/ Panel		Gas Tungsten Arc Welding (GTAW)		Shielded Metal Arc Welding (SMAW)
	Temperature		Do Not Switch While Welding		Arc Force (DIG)	%	Percent
	Output		Circuit Breaker		Remote	V	Volts
	Protective Earth (Ground)		Positive		Negative		Input
	On		Off	Hz	Hertz		Direct Current
U_0	Rated No Load Voltage (Average)	U_1	Primary Voltage	U_2	Conventional Load Voltage		Line Connection
I_1	Primary Current	I_2	Rated Welding Current	X	Duty Cycle		Three-Phase Transformer Rectifier
IP	Degree Of Protection		Three-Phase	S_1	KVA		Work Connection
	Wire Feeder		Electrode Connection				

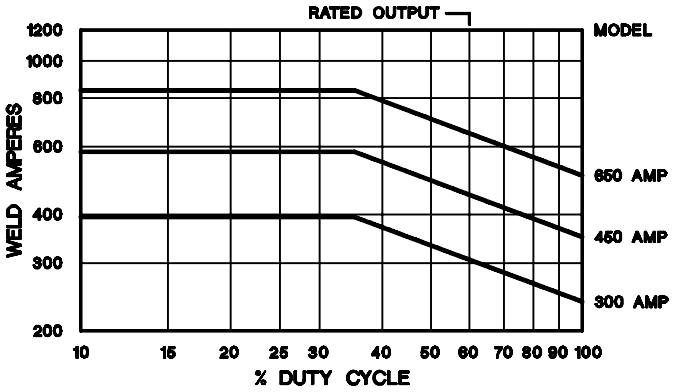
SECTION 3 – INSTALLATION

3-1. Specifications

Model	Rated Welding Output	Amp Range DC	Maximum Open-Circuit Voltage DC	IP Rating	Amperes Input at Rated Load Output, 50 or 60 Hz, Three-Phase								
					200 V	230 V	380 V	400 V	440 V	460 V	575 V	KVA	KW
300 Amp	300 A @ 32 Volts DC, 60% Duty Cycle	15 – 395	72 (70)	21M	70 4.0*	61 3.6*	35 1.1*	33 1.1*	31 1.0*	31 3.1*	25 1.5*	24.5 1.3*	13.8 0.67*
450 Amp	450 A @ 38 Volts DC, 60% Duty Cycle	20 – 590	72 (70)	21M	102 3.5*	89 3.1*	54 1.5*	51 1.4*	47 1.2*	45 1.5*	36 1.2*	35.5 1.2*	23.3 0.51*
650 Amp	650 A @ 44 Volts DC, 60% Duty Cycle	50 – 850	72 (70)	21M	––	124 5.2*	75 1.7*	71 1.6*	65 1.5*	62 2.6*	50 2.1*	49.4 2.1*	36 0.58*

*While idling
( ) Indicates specification differences for CE models

3-2. Duty Cycle And Overheating

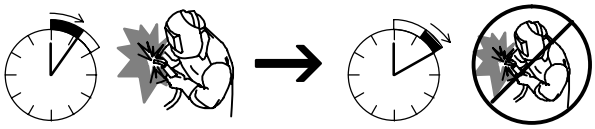


Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

If unit overheats, thermostat(s) opens, output stops, and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or duty cycle before welding.

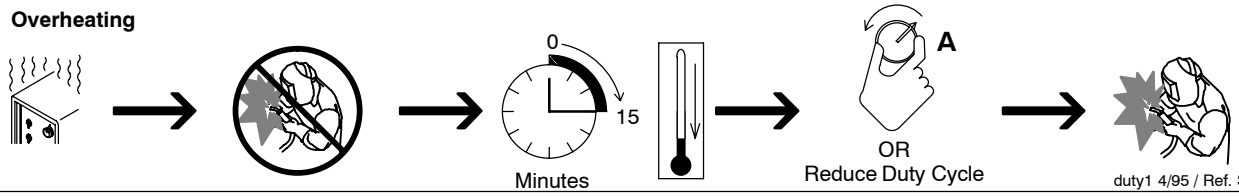
▲ **Exceeding duty cycle can damage unit and void warranty.**

Example: 60% Duty Cycle =



6 Minutes Welding — 4 Minutes Resting

Overheating



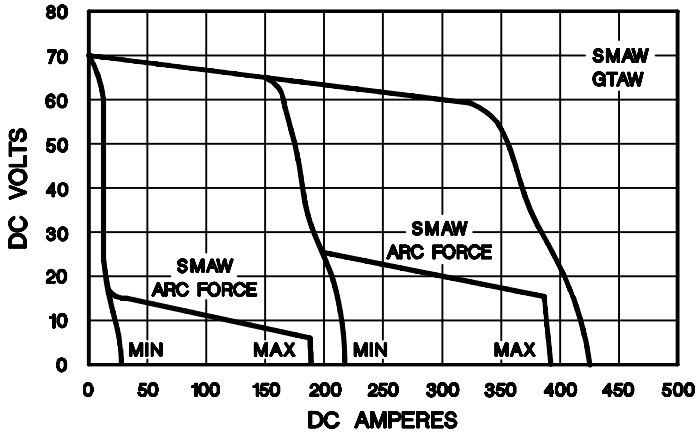
Minutes

duty1 4/95 / Ref. SA-168 919

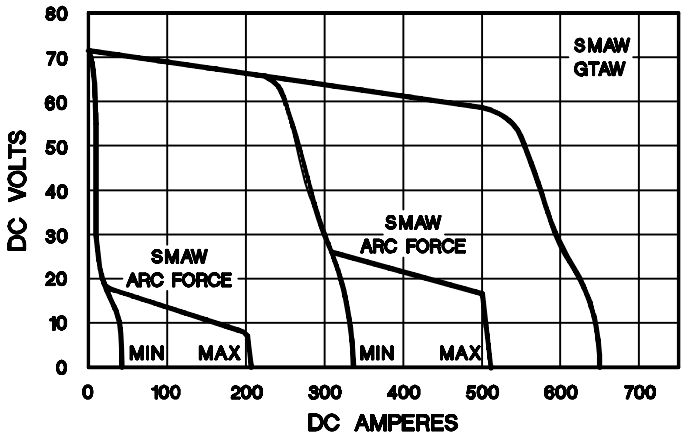
3-3. Volt-Ampere Curves

Volt-ampere curves show minimum and maximum voltage and amperage output capabilities of unit. Curves of other settings fall between curves shown.

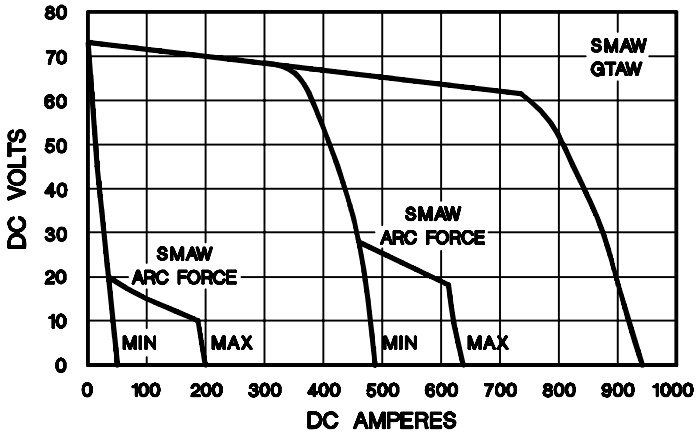
A. 300 Amp Model



B. 450 Amp Model



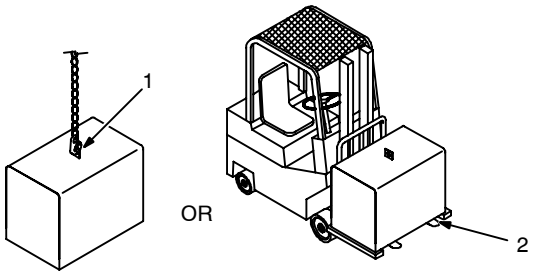
C. 650 Amp Model



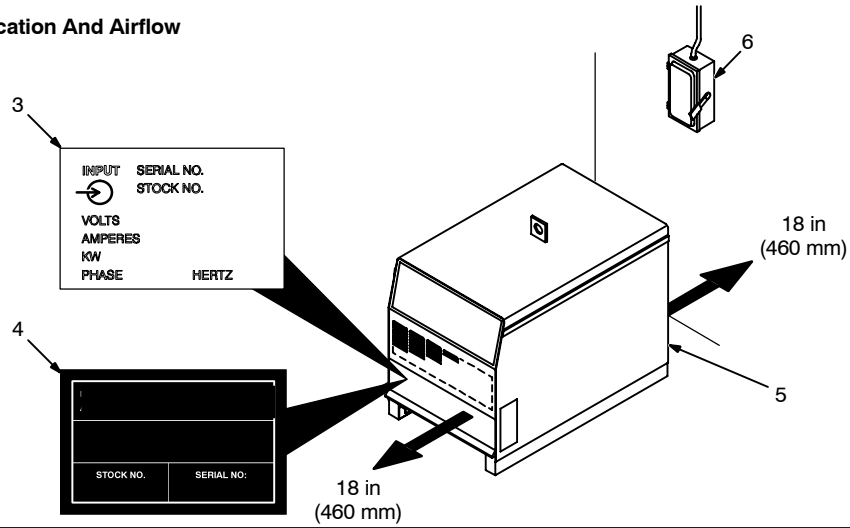
va_curve1 – 4/95 – SA-171 221 / SA-171 222 / SA-171 223

3-4. Selecting A Location

Movement



Location And Airflow



1 Lifting Eye

2 Lifting Forks

Use lifting eye or lifting forks to move unit.

If using lifting forks, extend forks beyond opposite side of unit.

3 Rating Label (Non CE Models Only)

Use rating label to determine input power needs. Label located under front access door.

4 Plate Label (CE Models Only)

Label located under front access door.

5 Rating Label (CE Models Only)

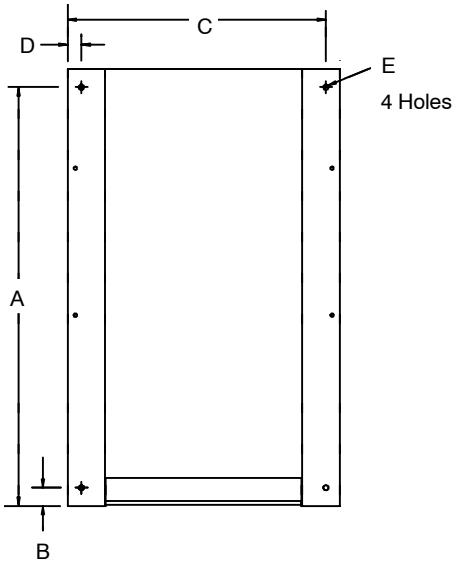
Use rating label to determine input power needs. Label located on rear access door (see Section 2-5).

6 Line Disconnect Device

Locate unit near correct input power supply.

▲ **Special installation may be required where gasoline or volatile liquids are present – see NEC Article 511 or CEC Section 20.**

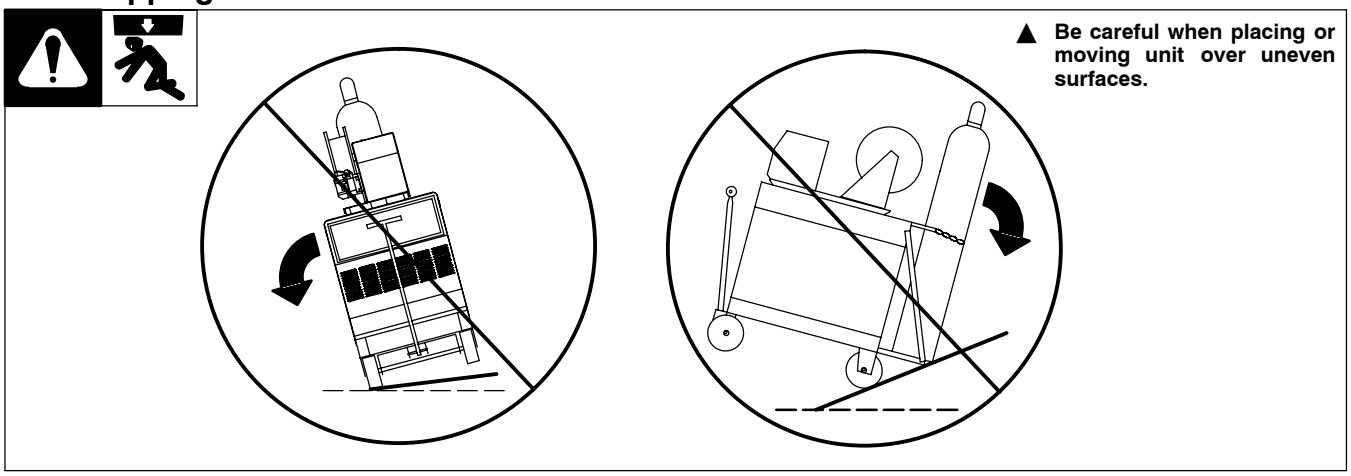
3-5. Dimensions And Weights



Ref. ST-153 556-A

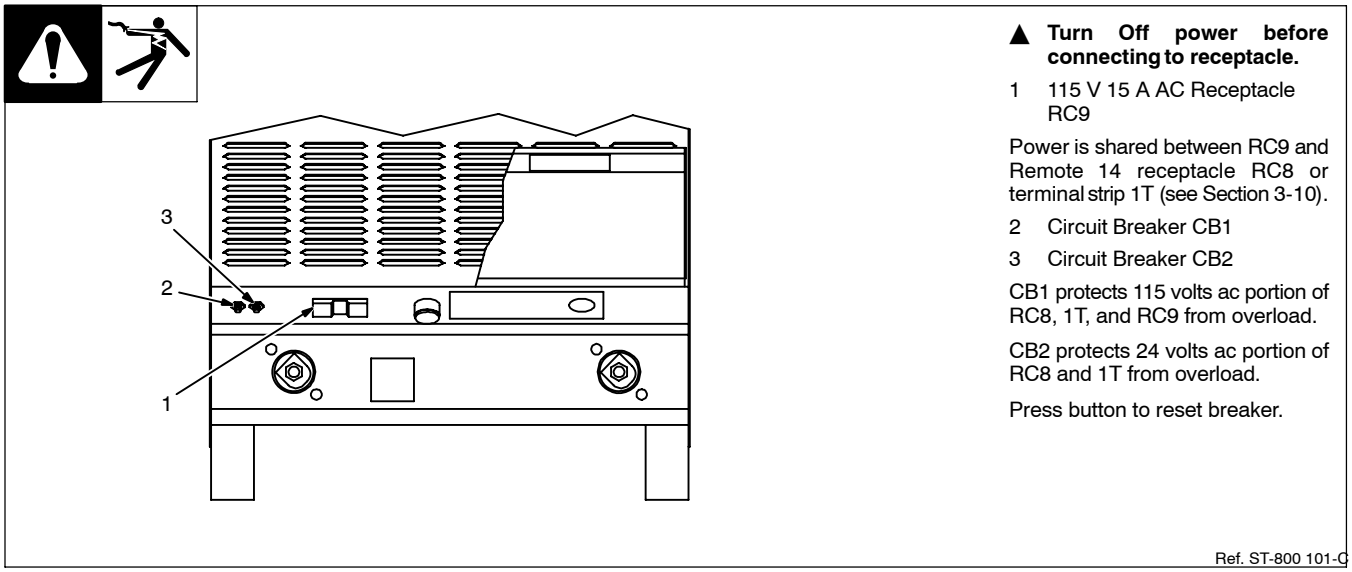
Dimensions	
Height	27-1/4 in (692 mm)
Width	22-1/4 in (565 mm)
Depth*	35-3/4 in (908 mm)
A**	35 in (889 mm)
B***	1-1/4 in (32 mm)
C	21 in (533 mm)
D	1-3/16 in (30 mm)
E	7/16 in (11 mm) Dia
*300 Amp Model = 28-1/4 in (718 mm) **300 Amp Model = 27-1/2 in (699 mm) ***300 Amp Model = 3/4 in (19 mm)	
Weight	
300 Amp	352 lb (160 kg)
450 Amp	404 lb (183 kg)
650 Amp	505 lb (299 kg)

3-6. Tipping



▲ **Be careful when placing or moving unit over uneven surfaces.**

3-7. 115 VAC Receptacle And Circuit Breakers



▲ **Turn Off power before connecting to receptacle.**

1 115 V 15 A AC Receptacle RC9

Power is shared between RC9 and Remote 14 receptacle RC8 or terminal strip 1T (see Section 3-10).

2 Circuit Breaker CB1

3 Circuit Breaker CB2

CB1 protects 115 volts ac portion of RC8, 1T, and RC9 from overload.

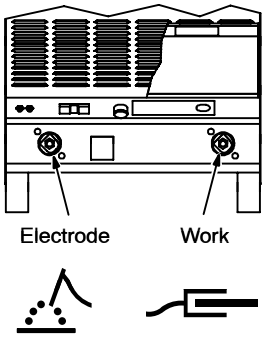
CB2 protects 24 volts ac portion of RC8 and 1T from overload.

Press button to reset breaker.

Ref. ST-800 101-C

3-8. Weld Output Terminals And Selecting Cable Sizes

Turn Off power before connecting to weld output terminals	Welding Amperes	Total Cable (Copper) Length In Weld Circuit Not Exceeding							
		100 ft (30 m) Or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
		10 – 60% Duty Cycle	60 – 100% Duty Cycle	10 – 100% Duty Cycle					
	100	4	4	4	3	2	1	1/0	1/0
	150	3	3	2	1	1/0	2/0	3/0	3/0
	200	3	2	1	1/0	2/0	3/0	4/0	4/0
	250	2	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
	300	1	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
	350	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0
	400	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	2-4/0
	500	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-3/0
	600	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-4/0	3-4/0
	700	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-4/0	3-4/0	4-4/0
	800	4/0	2-2/0	2-3/0	2-4/0	3-4/0	3-4/0	4-4/0	4-4/0



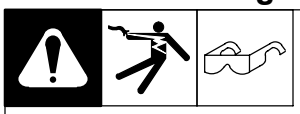
Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere. S-0007-D

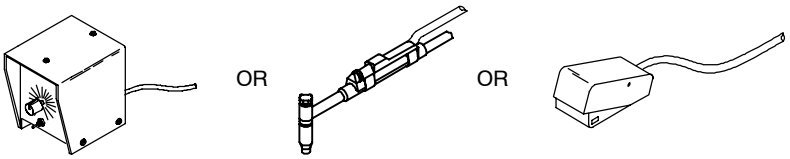
3-9. Remote 14 Receptacle And Terminal Strip 1T Information

	Socket	Terminal	Information
24 VOLTS AC OUTPUT (CONTACTOR)	A	A	24 volts ac. Protected by circuit breaker CB2.
	B	B	Contact closure to A completes 24 volts ac contactor control circuit.
REMOTE OUTPUT CONTROL	C	C	Command reference; 0 to +10 volts dc.
	D	D	Remote control circuit common.
	E	E	0 to +10 volts dc input command signal from remote control.
A/V AMPERAGE VOLTAGE	F	*	Current feedback; 0 to +10 volts dc, 1 volt per 100 amperes.
	H	*	Voltage feedback; 0 to +10 volts dc, 1 volt per 10 arc volts.
115 VOLTS AC OUTPUT (CONTACTOR)	I	I	115 volts, 15 amperes, 60 Hz ac. Protected by circuit breaker CB1.
	J	J	Contact closure to I completes 115 volts ac contactor control circuit.
GND	K	K	Chassis common.
	G	*	Circuit common for 24 and 115 volts ac circuits.
REMOTE POWER ON/OFF	*	L	To remote On/Off switch.
	*	M	
REMOTE VOLTAGE SENSING	*	N	Voltage sensing signal from Negative (-) weld output terminal.
	*	P	Voltage sensing signal from Positive (+) weld output terminal.

* Not Used

3-10. Connecting Remote Control





1 Remote 14 Receptacle RC8

Connect remote control to RC8. If plug does not fit, wire cord to terminal strip 1T.

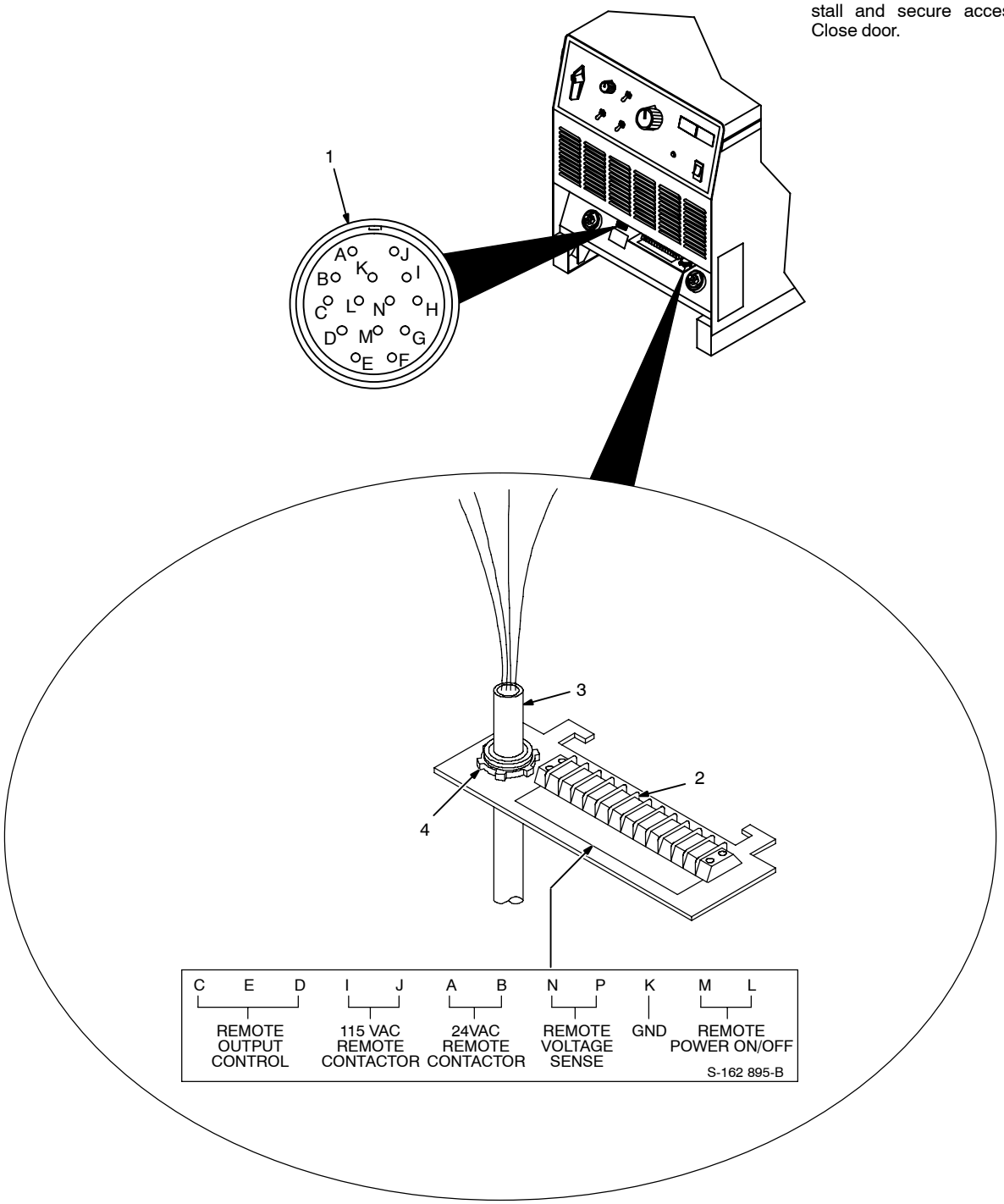
▲ **Turn Off power before opening terminal strip cover.**

2 Terminal Strip 1T

3 Remote Control Cord

4 Strain Relief (Customer Supplied)

Secure cord in strain relief. Reinstall and secure access panel. Close door.



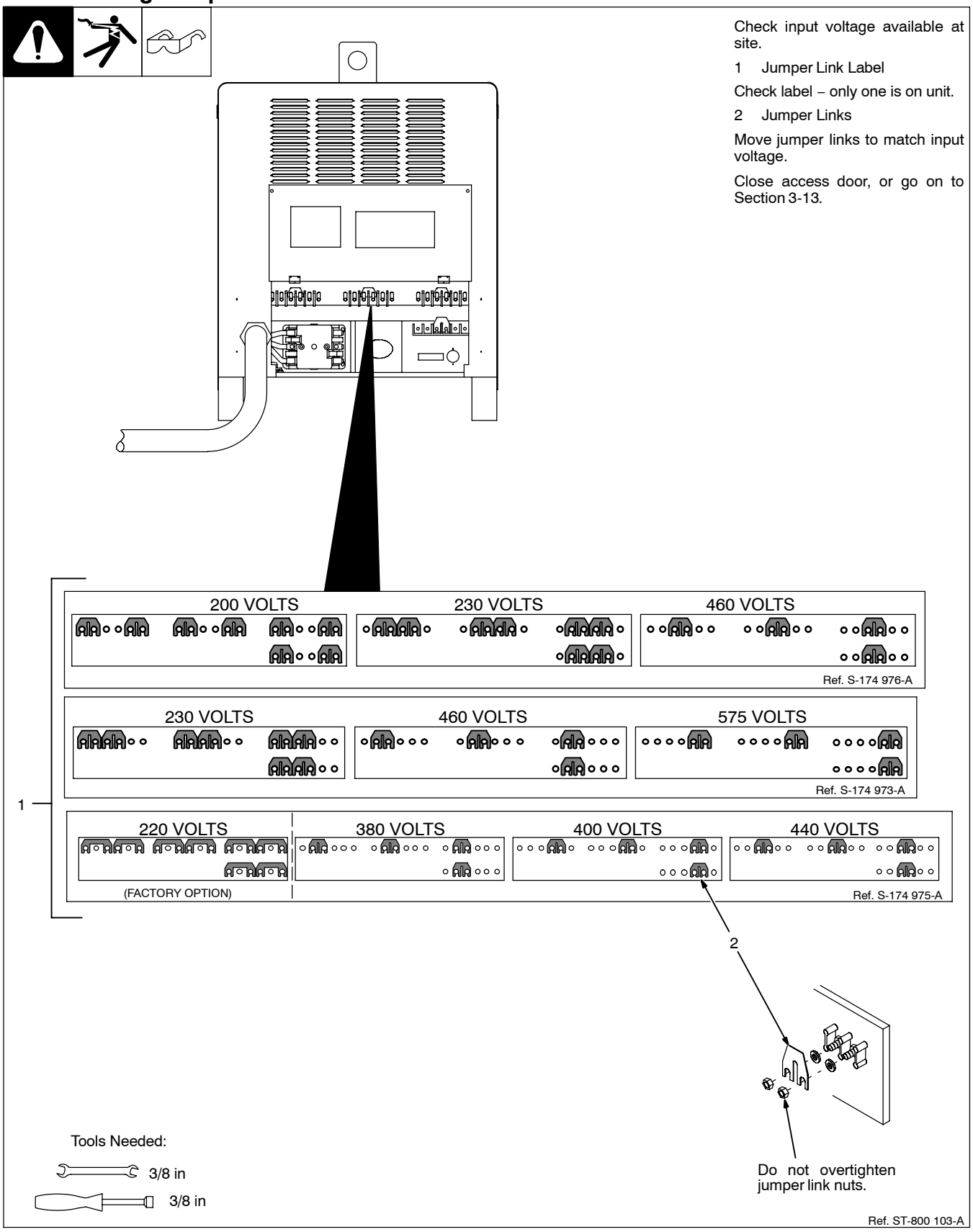
Ref. ST-800 898 / Ref. S-0004-A / Ref. ST-800 451-B

3-11. Electrical Service Guide

60 Hertz Models	300 Amp Model				450 Amp Model				650 Amp Model		
Input Voltage	200	230	460	575	200	230	460	575	230	460	575
Input Amperes At Rated Output	71	61	31	25	102	89	45	36	124	62	50
Max Recommended Standard Fuse Or Circuit Breaker Rating In Amperes	110	90	45	35	150	125	70	50	175	90	70
Min Input Conductor Size In AWG/ Kcmil	6	8	10	12	4	4	8	10	3	8	8
Max Recommended Input Conductor Length In Feet (Meters)	129 (39)	114 (35)	308 (94)	296 (90)	118 (36)	156 (47)	276 (84)	290 (88)	125 (38)	182 (55)	284 (86)
Min Grounding Conductor Size In AWG/Kcmil	6	8	10	12	6	6	8	10	6	8	8
Reference: 1996 National Electrical Code (NEC)											S-0092-J

50 Hertz Models	300 Amp Model			450 Amp Model			650 Amp Model		
Input Voltage	380	400	440	380	400	440	380	400	440
Input Amperes At Rated Output	35	33	31	54	51	47	75	71	65
Max Recommended Standard Fuse Or Circuit Breaker Rating In Amperes	60	50	50	80	80	70	125	110	100
Min Input Conductor Size In AWG/Kcmil	10	10	10	8	8	8	6	6	6
Max Recommended Input Conductor Length In Feet (Meters)	210 (64)	233 (71)	282 (86)	188 (57)	209 (64)	253 (77)	189 (58)	210 (64)	254 (77)
Min Grounding Conductor Size In AWG/Kcmil	10	10	10	8	8	8	6	6	8
Reference: 1996 National Electrical Code (NEC)									S-0092-J

3-12. Placing Jumper Links



Check input voltage available at site.

1 Jumper Link Label

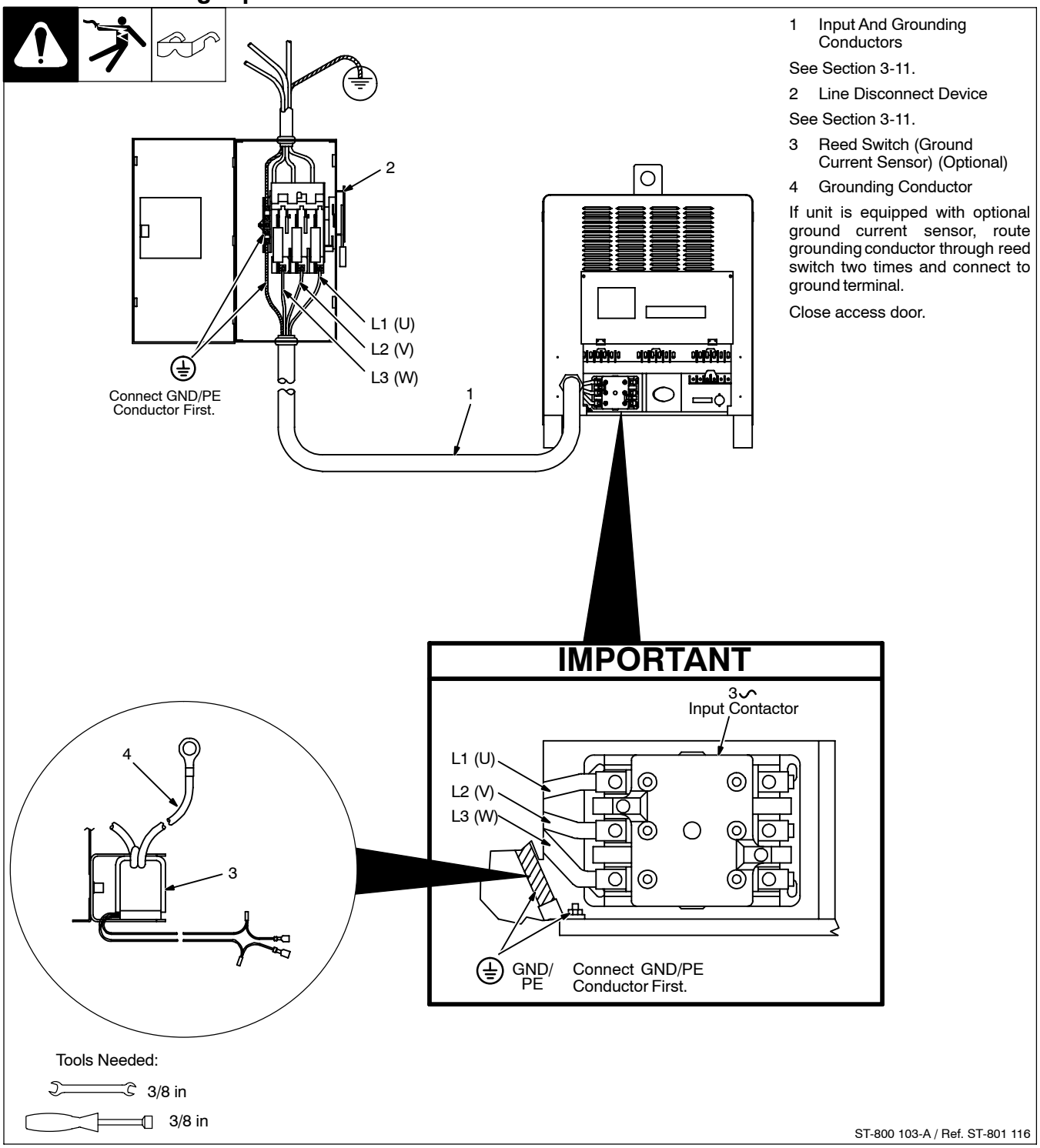
Check label – only one is on unit.

2 Jumper Links

Move jumper links to match input voltage.

Close access door, or go on to Section 3-13.

3-13. Connecting Input Power



1 Input And Grounding Conductors

See Section 3-11.

2 Line Disconnect Device

See Section 3-11.

3 Reed Switch (Ground Current Sensor) (Optional)

4 Grounding Conductor

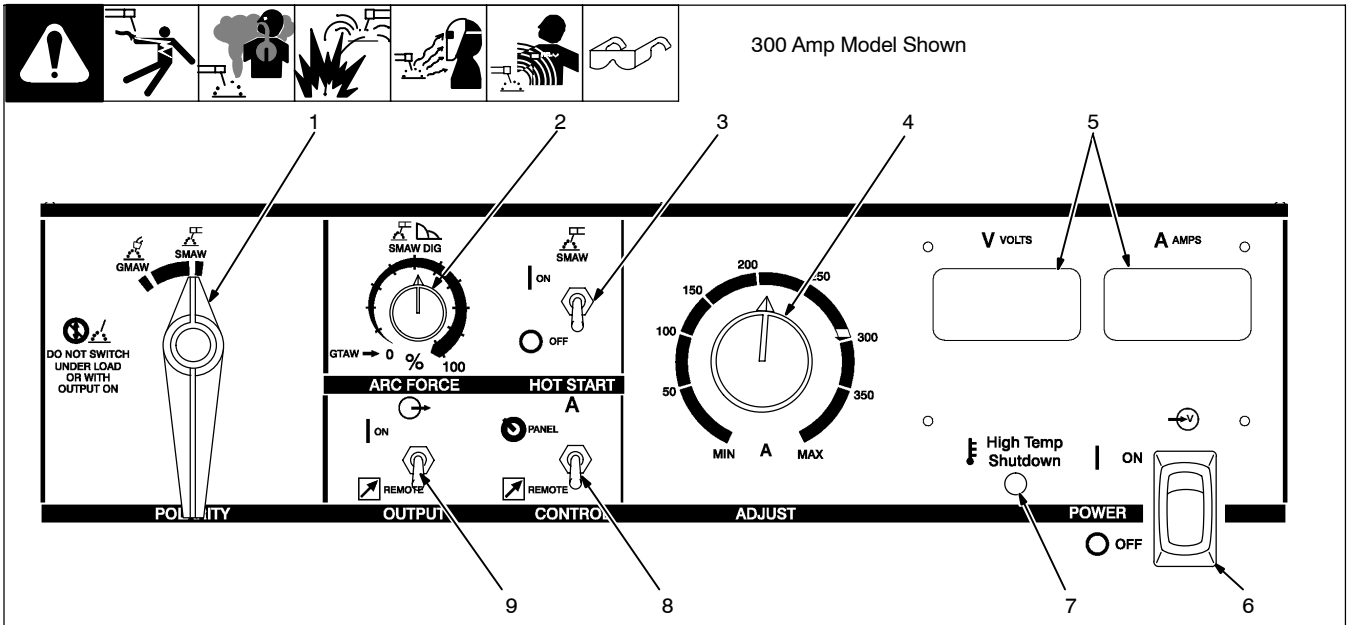
If unit is equipped with optional ground current sensor, route grounding conductor through reed switch two times and connect to ground terminal.

Close access door.

ST-800 103-A / Ref. ST-801 116

SECTION 4 – OPERATION

4-1. Controls (Non CE Models)



Ref. ST-165 596-B

1 Polarity Selector Switch (Optional On 50 Hz Models)

To change polarity on models not equipped with a Polarity Selector switch, reverse work and electrode cables at the weld output terminals (see Section 3-8).

▲ **Turn Off Power before reversing cables.**

2 Arc Force (Dig) Control

Control increases SMAW short-circuit amperage which allows the operator to use a very short arc length without sticking the electrode.

Set control at 0 for normal welding amperage. Turn clockwise to increase short-circuit amperage.

3 Hot Start Switch

Turn switch On for SMAW and Off for GTAW welding.

4 Amperage Adjustment Control

5 Digital Meters (Optional)

6 Power Switch With Indicator Light

7 High Temperature Shutdown Light

8 Remote Amperage Control Switch

For front panel control, place switch in Panel position. For remote control, place switch in Remote position, and connect remote device (see Section 3-10).

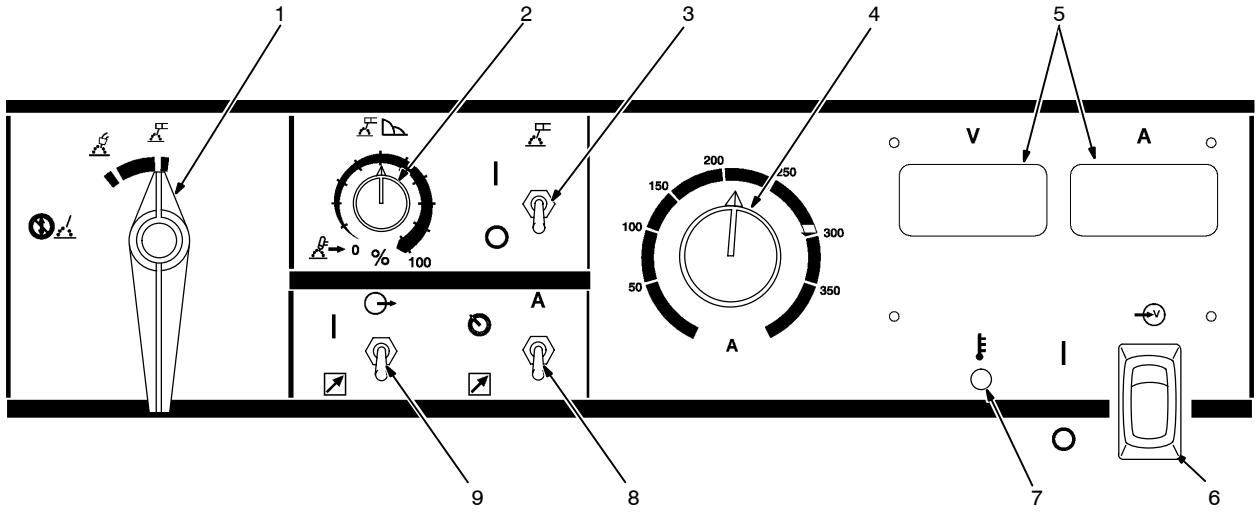
9 Output Switch (Contactor)

For front panel control of output, place switch in Panel position. For remote control of output, place switch in Remote position, and connect remote device (see Section 3-10).

▲ **Turn Off power before connecting remote device.**

4-2. Controls (CE Models)

300 Amp Model Shown



Ref. ST-173 450

1 Polarity Selector Switch (Optional On 50 Hz Models)

To change polarity on models not equipped with a Polarity Selector switch, reverse work and electrode cables at the weld output terminals (see Section 3-8).

▲ **Turn Off Power before reversing cables.**

2 Arc Force (Dig) Control

Control increases SMAW short-circuit amperage which allows the operator to use a very short arc length without sticking the electrode.

Set control at 0 for normal welding amperage. Turn clockwise to increase short-circuit amperage.

3 Hot Start Switch

Turn switch On for SMAW and Off for GTAW welding.

4 Amperage Adjustment Control

5 Digital Meters (Optional)

6 Power Switch With Indicator Light

7 High Temperature Shutdown Light

8 Remote Amperage Control Switch

For front panel control, place switch in Panel position. For remote control, place switch in Remote position, and connect remote device (see Section 3-10).

9 Output Switch (Contactor)

For front panel control of output, place switch in Panel position. For remote control of output, place switch in Remote position, and connect remote device (see Section 3-10).

▲ **Turn Off power before connecting remote device.**

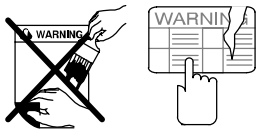
SECTION 5 – MAINTENANCE AND TROUBLESHOOTING

5-1. Routine Maintenance

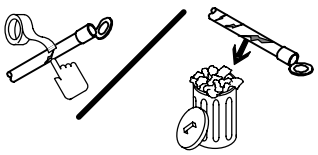
▲ **Disconnect power before maintaining.**

3 Months

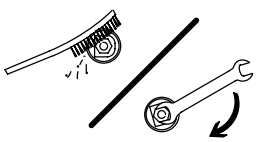
Replace unreadable labels.



Repair or replace cracked weld cable.

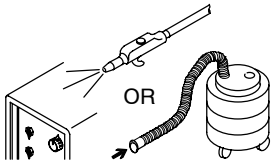


Clean and tighten weld terminals.

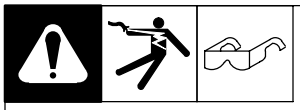


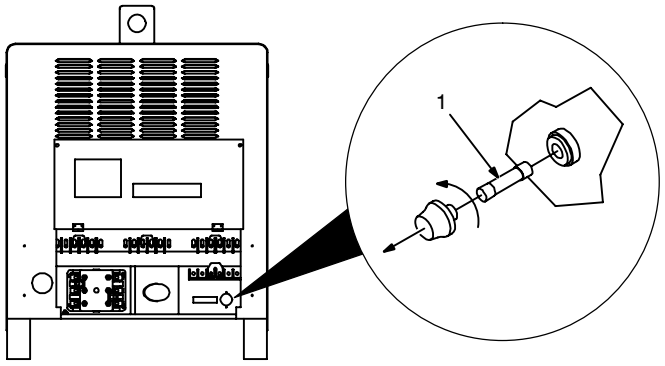
6 Months

Blow out or vacuum inside. During heavy service, clean monthly.



5-2. Fuse F1





▲ **Turn Off power before opening rear access door.**

1 Fuse F1 (See Parts List For Rating)

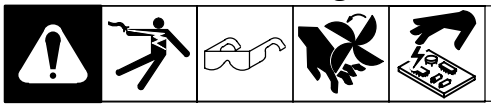
Fuse F1 protects control transformer from overload. If F1 opens, weld output and fan motor stops. Replace F1.

Tools Needed:

3/8 in

Ref. ST-800 101-C

5-3. Troubleshooting



Trouble	Remedy
No weld output; unit completely inoperative.	Place line disconnect switch in On position (see Section 3-13).
	Check fuse F1, and replace if necessary (see Section 5-2).
	Check and replace line fuse(s), if necessary, or reset circuit breaker (see Section 3-13).
	Check for proper input power connections (see Section 3-13).
	Check for proper jumper link position (see Section 3-12).
No weld output; Power switch pilot light on; fan on.	If using remote control, place Output (Contactor) switch in Remote 14 position, and connect remote control (see Sections 3-9 and 3-10). If remote is not being used, place switch in On position.
	Check, repair, or replace remote control.
	Unit overheated. Allow unit to cool with fan On (see Section 3-2).
	Have Factory Authorized Service Agent check control board PC1.
Unit provides only maximum or minimum weld output.	Have Factory Authorized Service Agent check control board PC1 and hall device HD1.
Erratic or improper weld output.	Use proper size and type of weld cable (see Section 3-8).
	Clean and tighten all weld connections.
	Check position of Polarity selector switch (see Section 4-1).
	Have Factory Authorized Service Agent check control board PC1 and hall device HD1.
No 115 volts ac output at duplex receptacle, Remote 14 receptacle, or terminal strip 1T.	Reset circuit breaker CB1 (see Section 3-7).
No 24 volts ac output at Remote 14 receptacle, or terminal strip 1T.	Reset circuit breaker CB2 (see Section 3-7).
Fan not operating. NOTE: fan only runs when cooling is necessary.	Check for and remove anything blocking fan movement.
	Have Factory Authorized Service Agent check fan motor.

SECTION 6 – ELECTRICAL DIAGRAM

For Primary Circuit Diagram Portion, refer to Circuit Diagram located inside wrapper of welding power source.

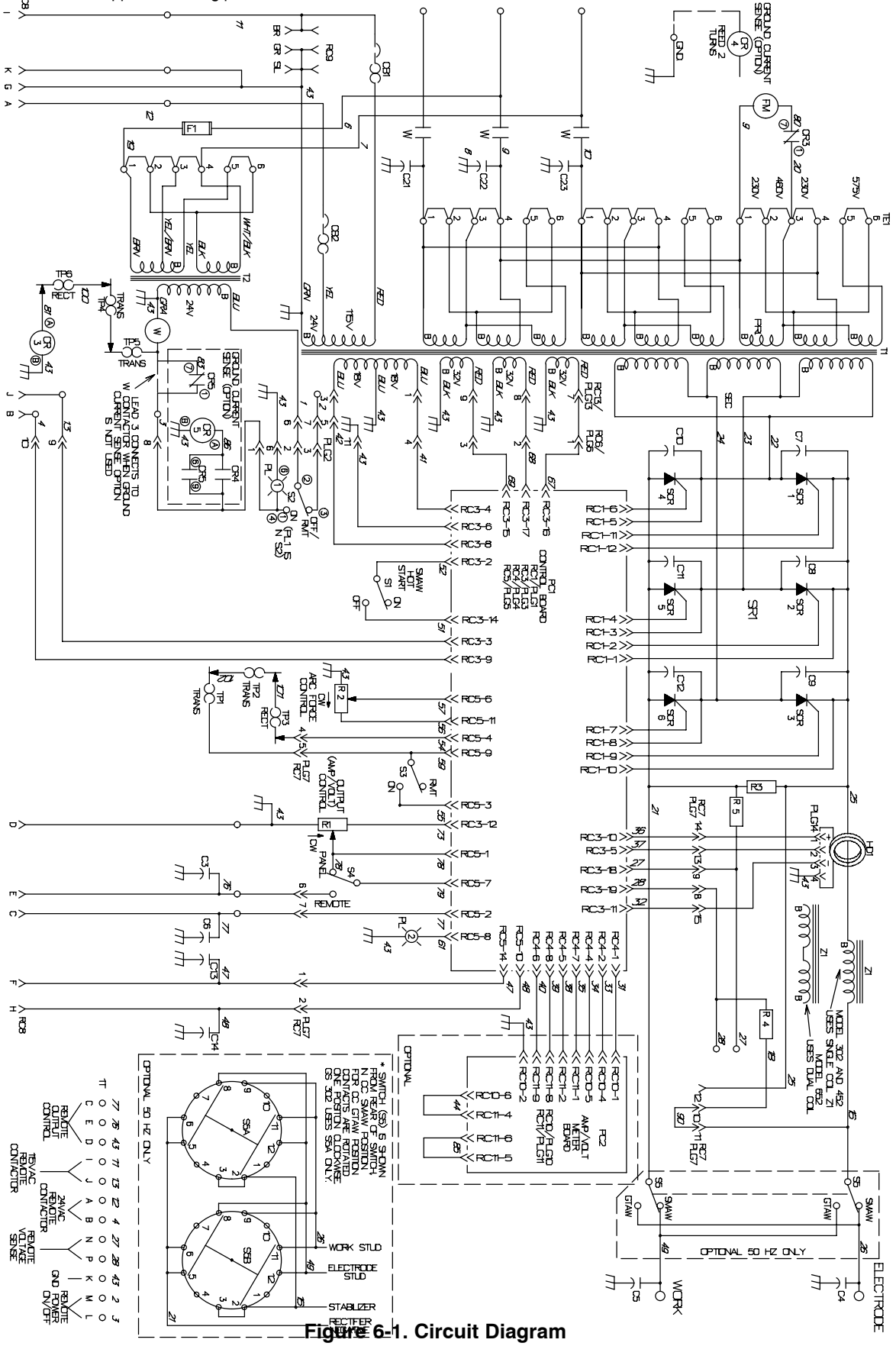


Figure 6-1. Circuit Diagram

SC-188 103
SC-184 397

☞ *Hardware is common and not available unless listed.*

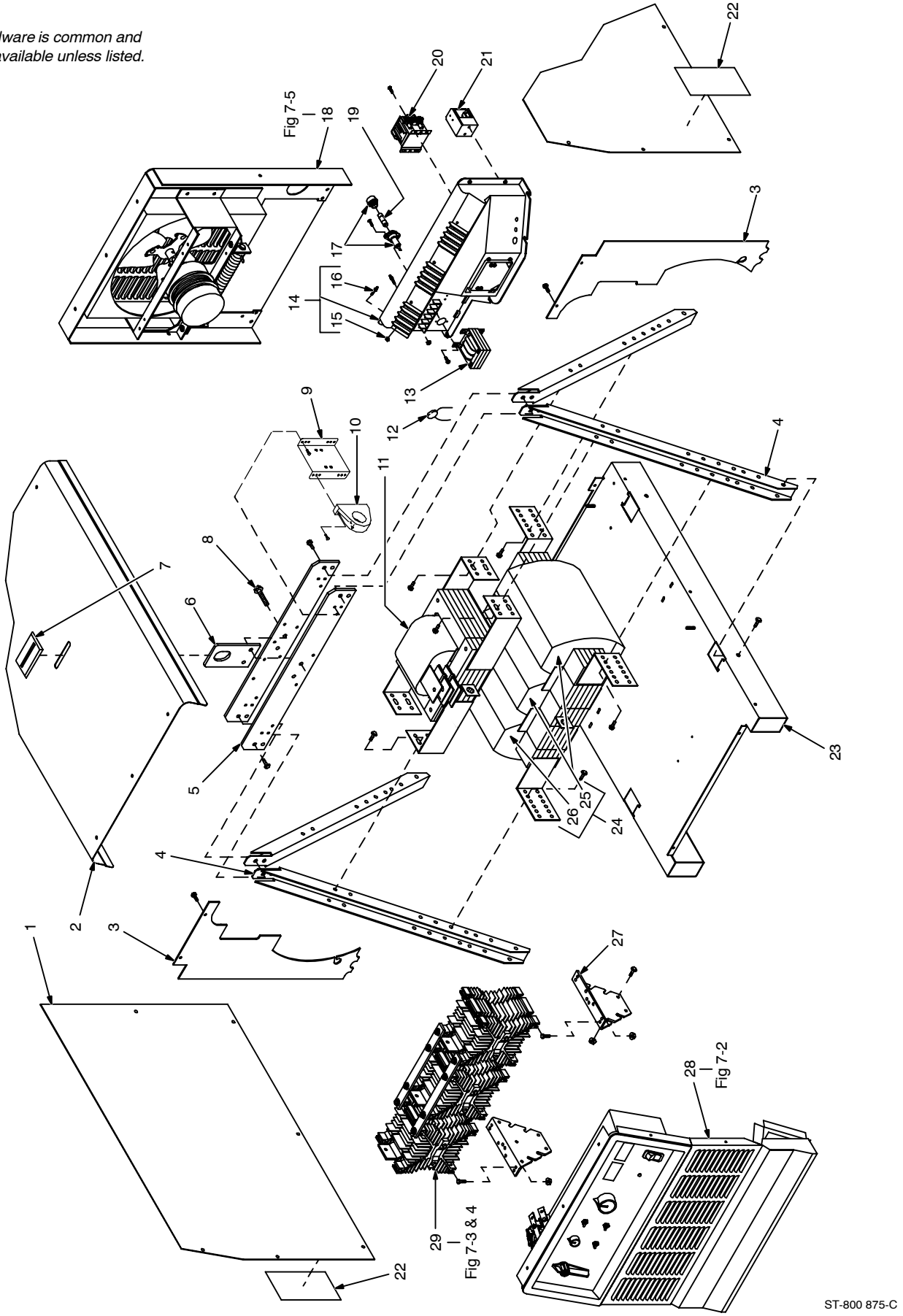


Figure 7-1. Main Assembly (452 Model Illustrated)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 302	452	652
			Figure 7-1. Main Assembly			
1		+179 430	PANEL, side	2		
1		+179 432	PANEL, side		2	2
2		179 429	COVER, top	1		
2		179 431	COVER, top		1	1
3		164 699	BAFFLE, air	2	2	
3		164 700	BAFFLE, air			2
4		162 816	CHANNEL, upright	4	4	4
5		162 820	BAR, mtg lift eye	2	2	2
6		162 830	LIFT EYE	1	1	1
7		177 279	GASKET, lift eye	1	1	1
8		604 536	SCREW, .312-18 x 1.75 hexhd-pln gr 5	2	2	2
9		173 605	BRACKET, mtg LEM	1	1	1
10	HD1	168 829	TRANSDUCER, current 300A module	1	1	1
	PLG14	182 363	CONNECTOR & SOCKETS	1	1	1
11	Z1	165 612	STABILIZER	1		
11	Z1	165 613	STABILIZER		1	
11	Z1	180 064	STABILIZER			1
		164 717	BUS BAR, stabilizer			1
12	C21-23	163 906	CAPACITOR, 60Hz	3	3	3
12	C21-23	179 904	CAPACITOR, 50Hz	3	3	3
13	T2	159 042	TRANSFORMER, control 50VA 24V 230/460/575 (60Hz)	1	1	1
13	T2	159 041	TRANSFORMER, control 50VA 24V 200/230/460 (60Hz)		1	
13	T2	159 043	TRANSFORMER, control 50VA 24V (50Hz)	1	1	1
14	TE1	159 244	PRIMARY BOX, (consisting of)	1	1	1
15		601 835	NUT, 10-32 brs	24	24	24
16		038 887	STUD, pri bd brs 10-32 x 1.375	24	24	24
		010 913	WASHER, flat .218 ID brs	24	24	24
		601 835	NUT, 10-32 brs	24	24	24
		038 618	LINK, jumper term bd pri	8	8	8
17		159 034	HOLDER, fuse mintr	1	1	1
18		Fig 7-5	PANEL, rear w/components	1	1	1
19	F1	*156 065	FUSE, crtg .5A 600V time delay	1	1	1
20	W	160 760	CONTACTOR, def prp 40A 3P 24VAC	1		
20	W	160 793	CONTACTOR, def prp 60A 3P 24VAC		1	
20	W	160 794	CONTACTOR, def prp 75A 3P 24V			1
21	CR4	♦140 750	SWITCH, reed	1	1	1
22		134 464	LABEL, warning general precautionary	2	2	2
23		163 533	BASE	1		
23		163 359	BASE		1	1
24	T1	165 719	TRANSFORMER, pwr main 200/230/460 (consisting of)	1		
25		165 234	COIL, pri/sec 200/230/460 (center & RH)	2		
26		165 235	COIL, pri/sec 200/230/460 (LH)	1		
24	T1	172 207	TRANSFORMER, pwr main 230/460/575 (consisting of)	1		
25		172 209	COIL, pri/sec 230/460/575 (center & RH)	2		
26		172 208	COIL, pri/sec 230/460/575 (LH)	1		
24	T1	165 720	TRANSFORMER, pwr main 200/230/460 (consisting of)		1	
25		165 232	COIL, pri/sec 200/230/460 (center & RH)		2	
26		165 233	COIL, pri/sec 200/230/460 (LH)		1	
24	T1	172 213	TRANSFORMER, pwr main 230/460/575 (consisting of)		1	
25		172 215	COIL, pri/sec 230/460/575 (center & RH)		2	
26		172 214	COIL, pri/sec 230/460/575 (LH)		1	
24	T1	172 219	TRANSFORMER, pwr main 230/460/575 (consisting of)			1
25		172 221	COIL, pri/sec 230/460/575 (center & RH)			2
26		172 220	COIL, pri/sec 230/460/575 (LH)			1
24	T1	172 403	TRANSFORMER, pwr main 380/400/440 (consisting of)	1		
25		172 404	COIL, pri/sec (center & RH)	2		
26		172 405	COIL, pri/sec (LH)	1		

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 302	452	652

Figure 7-1. Main Assembly (Continued)

24	T1	172 408	TRANSFORMER, pwr main 380/400/440 (consisting of)	1		
25		172 410	COIL, pri/sec (center & RH)	2		
26		172 409	COIL, pri/sec (LH)	1		
24	T1	172 413	TRANSFORMER, pwr main 380/400/440 (consisting of)			1
25		172 416	COIL, pri/sec (center & RH)			2
26		172 415	COIL, pri/sec (LH)			1
	TP1,2	119 581	THERMOSTAT, NC (Included w/T1)	2	2	2
	TP4,5	168 891	THERMOSTAT, NC (Included w/T1)	2	2	2
	PLG13	169 242	CONNECTOR & PINS	1	1	1
	PLG6	168 847	CONNECTOR & SOCKETS	1	1	1
	RC6	168 845	CONNECTOR & PINS	1	1	1
27		161 294	BRACKET, mtg rectifier	2	2	2
28		Fig 7-2	PANEL, front w/components	1	1	1
29	SR1	175 070	RECTIFIER, si diode (Fig 7-3)	1		
29	SR1	175 071	RECTIFIER, SCR main (Fig 7-4)	1		
29	SR1	175 072	RECTIFIER, SCR main (Fig 7-4)			1
	PLG7	152 249	CONNECTOR & PINS	1	1	1
	RC7	168 846	CONNECTOR & SOCKETS	1	1	1
		010 467	CONNECTOR, clamp cable 1.250	1	1	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
*Recommended Spare Parts.
♦Part of Option 042 983 Ground Current Sensor
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 302	452	652
			Figure 7-2. Panel, Front w/Components (Fig 7-1 Item 28)			
1	S5	♦169 331	SWITCH, mode polarity (single deck)	1		
1	S5	♦169 332	SWITCH, mode polarity (double deck)	1	1	
2	PC1	187 822	CIRCUIT CARD, control (60Hz)	1		
2	PC1	186 937	CIRCUIT CARD, control (60Hz)	1		
2	PC1	187 825	CIRCUIT CARD, control (60Hz)			1
2	PC1	187 823	CIRCUIT CARD, control (50Hz)	1		
2	PC1	187 824	CIRCUIT CARD, control (50Hz)	1		
2	PC1	187 826	CIRCUIT CARD, control (50HZ)			1
	PLG1	158 720	CONNECTOR & SOCKETS, (see Fig 7-3 & 4)			
	PLG3	169 240	CONNECTOR & SOCKETS, (consisting of)	1	1	1
		147 995	CONNECTOR, rect skt 22-18ga	20	20	20
	PLG5	152 249	CONNECTOR & SOCKETS, (consisting of)	1	1	1
		147 995	CONNECTOR, rect skt 22-18ga	15	15	15
3	CR3	006 393	RELAY, encl 24VAC DPDT	1	1	1
4	CR5	♦♦006 393	RELAY, encl 24VAC DPDT	1	1	1
5	CB1,2	093 995	CIRCUIT BREAKER, man reset 1P 15A 250VAC	2	2	2
6	RC9	604 176	RECEPTACLE, str dx grd 2P3W 15A 125V	1	1	1
7		163 855	CONNECTOR/CAPACITOR, w/leads (consisting of)	1	1	1
	RC8	143 976	CONNECTOR & SOCKETS, (consisting of)	1	1	1
		079 534	CONNECTOR, circ skt push-in 14-18ga	14	14	14
	C3	163 863	LEAD ASSEMBLY, elect	1	1	1
	C6	163 861	LEAD ASSEMBLY, elect	1	1	1
	C13	163 858	LEAD ASSEMBLY, elect	1	1	1
	C14	163 857	LEAD ASSEMBLY, elect	1	1	1
8		162 802	PANEL, front	1	1	1

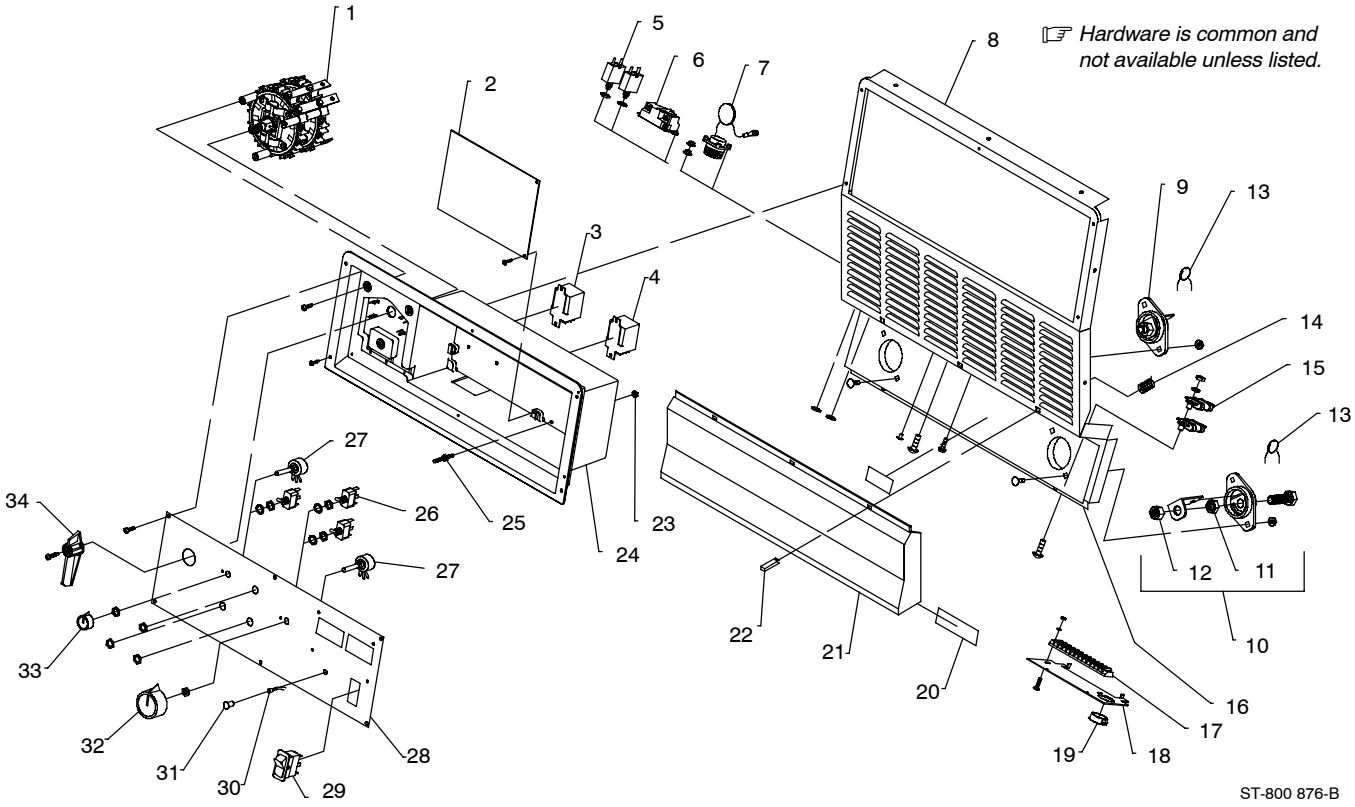


Figure 7-2. Panel, Front w/Components (452 Model Illustrated)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 302	452	652
			Figure 7-2. Panel, Front w/Components (Fig 7-1 Item 28) (Continued)			
9	POS	181 245	TERMINAL, pwr output red (consisting of)	1	1	1
10	NEG	181 246	TERMINAL, pwr output black (consisting of)	1	1	1
11		601 880	NUT, .500-13 x .31 high stl	1	1	1
12		601 879	NUT, .500-13 x .44 high stl	1	1	1
13	C4,5	128 750	CAPACITOR, cer disc .1uf 500VDC	2	2	2
14		161 303	SPRING, cprsn .600 OD x .072 wire x 1.500 lg	3	3	3
15	R4,5	136 076	RESISTOR, WW fxd 30W 200 ohm	2	2	2
16		174 939	PLATE, control lower	1	1	1
17	1T	159 040	BLOCK, term 20A 12P	1	1	1
18		162 828	PANEL, mtg rcpt/terminal strip	1	1	1
19		070 371	BLANK, snap-in nyl 1.093/1.125mtg hole	1	1	1
20		162 891	LABEL, warning electric shock	1	1	1
21		+172 587	COVER, stud output	1	1	1
22		160 935	CLIP, spring	3	3	3
23		601 835	NUT, 10-32 brs	2	2	2
		010 913	WASHER, flat .218 ID x .460 OD x .031thk brs	1	1	1
24		159 863	ELECTRONICS BOX	1	1	1
25		038 887	STUD, pri bd brs 10-32 x 1.375	1	1	1
26	S1,3,4	011 609	SWITCH, tgl SPDT 15A 125VAC	3	3	3
27	R1,2	035 897	POTENTIOMETER, CP std slot 1/T 2W 1K ohm	2	2	2
28			NAMEPLATE, (order by model and serial number)	1	1	1
29	S2	159 039	SWITCH, rocker SPDT 15A 125VAC	1	1	1
	PLG2	185 626	CONNECTOR, body 56 series	1	1	1
30	PL2	159 522	LED, yellow	1	1	1
31		159 036	LENS, LED clear	1	1	1
32		097 924	KNOB, pointer	1	1	1
33		097 922	KNOB, pointer	1	1	1
34		♦148 956	HANDLE, switch	1	1	1
		♦♦♦042 967	DIGITAL METER KIT, (consisting of)	1		
		♦♦♦043 107	DIGITAL METER KIT, (consisting of)		1	
		♦♦♦043 108	DIGITAL METER KIT, (consisting of)			1
	PC2	158 791	CIRCUIT CARD, digital meter	1		
	PC2	163 788	CIRCUIT CARD, digital meter		1	
	PC2	163 789	CIRCUIT CARD, digital meter			1
	PLG4,11	148 439	CONNECTOR & SOCKETS	2	2	2
	PLG10	153 501	CONNECTOR & SOCKETS	1	1	1
		165 316	STAND-OFF, No. 6-32 x .875 lg	4	4	4

♦Standard w/60 Hz/Optional w/50 Hz

♦♦Part of Option 042 983 Ground Current Sensor

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

♦♦♦Optional

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
	SR1	**175 070**	**Figure 7-3. Rectifier, Si Diode (302 Model) (Fig 7-1 Item 29)**	
1	C7-12	048 420	CAPACITOR, cer disc .01uf 1000VDC	6
2		177 316	HEAT SINK, rect	3
3		177 317	HEAT SINK, rect	2
4		175 258	CLAMP, thyristor rect	3
5	TP3	604 515	THERMOSTAT, NC	1
6	TP6	168 898	THERMOSTAT, NC	1
7	SCR1-6	161 668	THYRISTOR, SCR 300A 300V hockey puck	6
	PLG1	158 720	CONNECTOR & SOCKETS	1
8		166 667	CLAMP, thyristor rectifier 4.250	3

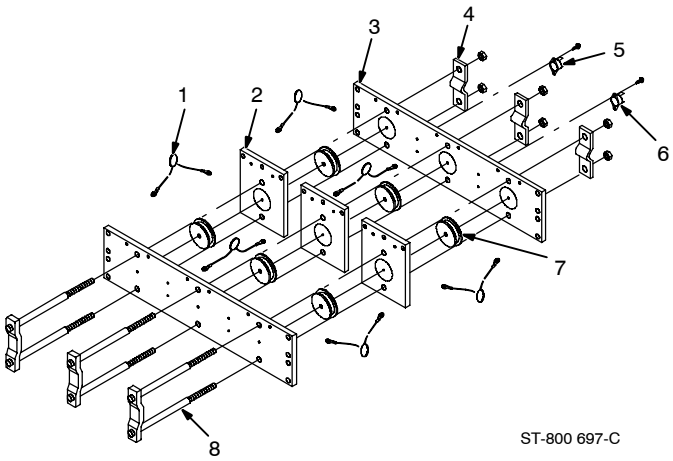


Figure 7-3. Rectifier, Si Diode SR1 (302 Model)

☞ *Hardware is common and not available unless listed.*

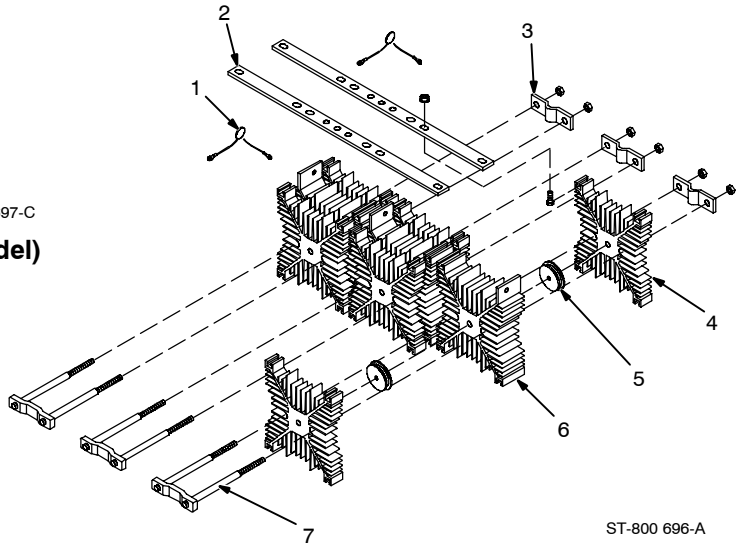


Figure 7-4. Rectifier, SCR Main SR1 (452 & 652 Model)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity	
	SR1		**Figure 7-4. Rectifier, SCR Main (452 & 652 Model) (Fig 7-1 Item 29)**	175 071	175 072
1	C7-12	048 420	CAPACITOR, cer disc .01uf 1000VDC	6	6
2		176 168	BAR, mtg rectifier	2	2
3		166 667	CLAMP, spring thyristor rectifier 5.500	3	3
4		160 962	HEAT SINK, rectifier snowflake .800	6	6
5	SCR1-6	161 668	THYRISTOR, SCR 300A 300V hockey puck	6	
5	SCR1-6	148 091	THYRISTOR, SCR 865A 300V hockey puck		6
6		160 961	HEAT SINK, rectifier snowflake 1.600	3	3
7		161 302	CLAMP, thyristor rectifier 5.375	3	3
	PLG1	158 720	CONNECTOR & SOCKETS	1	1
	TP3	168 895	THERMOSTAT, rectifier	1	1
	TP6	168 894	THERMOSTAT, rectifier	1	1

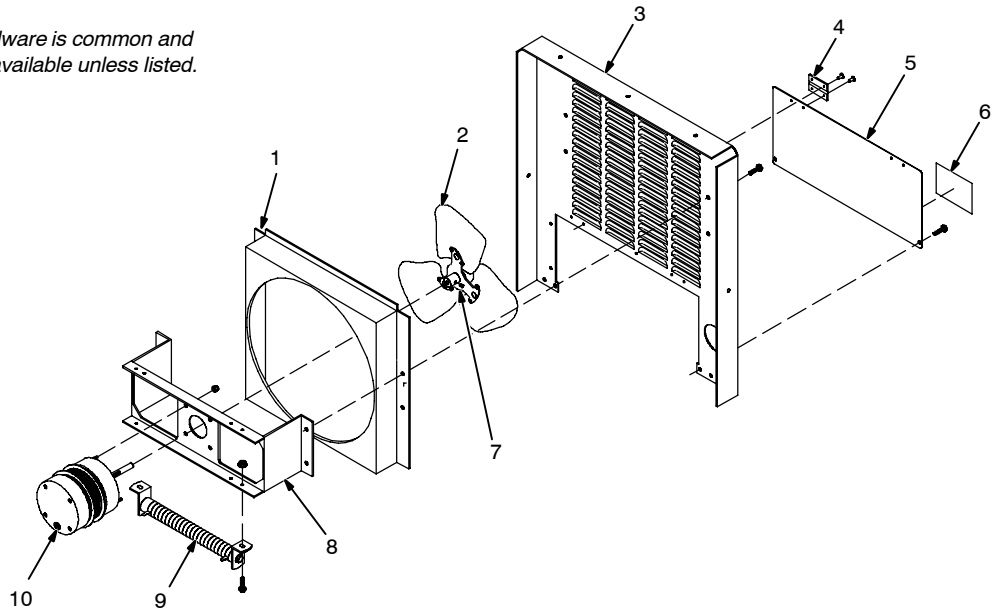
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 7-5. Panel, Rear w/Components (Fig 7-1 Item 18)

1		173 283	CHAMBER, plenum 14 in	1
2		180 165	BLADE, fan 14 in 3wg 23deg .375 bore CCW	1
3		162 807	PANEL, rear	1
4		168 343	HINGE, door primary	2
5		+162 818	DOOR, access primary	1
6		168 384	LABEL, warning electric shock	1
7		602 177	SCREW, set .250-20 x .250knrlpt sch stl	2
8		124 274	BRACKET, mtg fan motor	1
9	R3	097 459	RESISTOR, WW fxd 375W 20 ohm	1
10	FM	116 190	MOTOR, 1/12HP 230V 1550RPM 50/60Hz 1.5A	1
		010 467	CONNECTOR, clamp cable 1.250	1

☞ *Hardware is common and not available unless listed.*



ST-800 707-A

Figure 7-5. Panel, Rear w/Components

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

OPTIONS AND ACCESSORIES

A variety of optional controls and accessories allow you to tailor your Gold Star welder to meet your specific needs. All are specifically designed to be used with Gold Star Series power sources, so you never have to worry about compatibility.

REMOTE ON/OFF CONTROL

(#042 869)

Allows you to turn your Gold Star on or off from a distance of 20 ft. (6 m). This is especially useful if your power source is located up in a mezzanine. Connects to the power source's terminal strip.

DIGITAL METERS

(#042 967 Field**)** Gold Star 302

(#043 107 Field**)** Gold Star 452

(#043 108 Field**)** Gold Star 652

Easy to install, front panel mount, digital amp and volt meters.

STANDARD RUNNING GEAR

(#042 886)

The large 10 in. (254 mm) rear wheels and 5 in. (127 mm) front casters on this running gear provide excellent mobility on the shop floor, making it easier to move the power source around and over cables and cracks. Very easy to install. Handles double as weld cable holder.

ROUGH TERRAIN RUNNING GEAR

(#043 043)

This two-wheel running gear features pneumatic tires for extra mobility. Handles double as a cable holder. (Not compatible with cylinder rack.)

INTERNATIONAL CABLE ADAPTER

(#168 077) Female 1 Qty.

Dinse brand insulated female twist lock connector installs on output stud, providing quick disconnect of secondary weld cables.

(#042 418) Male 1 Qty.

Cable mounted Dinse brand insulated male twist lock connector accepts #1 or #2 AWG cable sizes.

ENVIRONMENTAL PROTECTION PACKAGE

(#043 049 Factory**)**

Internal machine components are sprayed with a protective polyurethane coating.

CYLINDER RACK/LIFT

(#043 005)

Miller's patent pending cylinder rack features a lift which moves the cylinders up onto the rack and into position **without** manual lifting! The rack accommodates two cylinder bottles, and can be attached directly to the running gear.

STANDARD CYLINDER RACK

(#042 887)

Holds two cylinders. Only installs on standard running gear **#042 886.**

AIR FILTER KIT

(#042 939 Field**)**

Protect your Gold Star from dusty, dirty environments with this reusable air filter that easily attaches and detaches from the front of the power source.

GROUND CURRENT SENSOR

(#042 983 Factory**)**

(#043 146 Field**)**

Disables power source if weld current is present on primary ground.

CE SPECIFICATIONS OPTION

(#043 560)

Modifications to 50 Hz models to meet CE Specification IEC-974-1 and EN-60974-1.

WATER COOLANT SYSTEMS

For more information, see the Miller Coolant Systems literature sheet, Index No. AY/7.2.

WATERMATE 1A

(#042 495) 115 VAC

For use with water-cooled torches rated up to 500 Amps. Vertical design conveniently mounts to Miller cylinder rack in place of one cylinder.

COOLMATE 3

(#043 007) 115 VAC

(#043 008) 230 VAC

For use with water-cooled torches rated up to 600 Amps. Unique paddle-wheel indicator, external filter and easy fill spout.

COOLMATE 4

(#042 288)

For use with water-cooled torches rated up to 600 Amps. Tough molded polyethylene case with carrying handle.

HF-251D-1 HIGH-FREQUENCY ARC STARTER/STABILIZER

(#042 388)

This portable 250 Amp, 60% duty cycle unit adds high frequency to the welding circuit to help start the arc when using the GTAW (TIG) process. Operates on 115 VAC 50/60/100 Hz. For more information, see the literature sheet, Index No. AY 5.1.

REMOTE CONTROLS AND SWITCHES

RMLS-14

(#129 337)

Momentary- and maintained-contact rocker switch for contactor control. Push forward for maintained contact and back for momentary contact. Includes 20 ft. (6 m) cord and 14-pin plug.

OPTIONS AND ACCESSORIES

RCC-14 REMOTE CONTACTOR AND CURRENT CONTROL

(#151 086)

Rotary motion fingertip control. Fastens to TIG torch using two Velcro strips. Allows complete current and contactor control at operator's fingertips. Includes 28 ft. (8.5 m) cord and plug.

RHC-14 HAND CONTROL

(#129 340)

Miniature hand control for remote current and contactor control. Dimensions: 4 in. (102 mm) x 4 in. (102 mm) x 3-1/4 in. (82 mm). Includes 20 ft. (6 m) cord and 14-pin plug.

RFCS-14 FOOT CONTROL

(#043 554)

Heavy duty foot current and contactor control. Includes 20 ft. (6 m) cord and 14-pin plug.

EXTENSION CABLES FOR 14-PIN PLUGS TO 14-PIN SOCKETS

(#122 973) 25 ft. (7.6 m)

(#122 974) 50 ft. (15.2 m)

(#122 975) 75 ft. (22.8 m)

Extension cords make a direct connection between the power source and the accessory control. No messy splicing or adapting required.

MIG (GMAW)/FLUX CORED (FCAW) WELDING

S-32S PORTABLE WIRE FEEDER

(#088 816)

For .035 - 5/64 in. (0.6 - 2.0 mm) flux-cored wire. See literature, Index No. M/6.21.

SUPER S-32P SERIES COMPACT, PORTABLE WIRE FEEDER

(#159 928)

For .035 - 5/64 in. (0.6 - 2.0 mm) flux cored wire. See literature, Index No. M/6.26.

Owner's Record

Please complete and retain with your personal records.

Model Name	**Serial/Style Number**
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	**Zip**

Resources Available

Always provide Model Name and Serial/Style Number.

Contact your Distributor for: To locate distributor nearest you call 1-800-4-A-Miller	Welding Supplies and Consumables Options and Accessories Personal Safety Equipment Service and Repair Replacement Parts Training (Schools, Videos, Books) Owner's Manuals Technical Manuals (Servicing Information and Parts) Circuit Diagrams Welding Process Handbooks
Contact the Delivering Carrier for: For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.	File a claim for loss or damage during shipment.

Miller Electric Mfg. Co.
An Illinois Tool Works Company
1635 West Spencer Street
Appleton, WI 54914 USA

International Headquarters–USA
Phone: 920-734-9821
USA & Canada FAX: 920-735-4134
International FAX: 920-735-4125

European Headquarters – United Kingdom
Phone: 44 (0) 1625-525556
FAX: 44 (0) 1625-537553

Miller
The Power of Blue.

PRINTED IN USA

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ATRA-ARC®

OM-222H November 1997

Eff. w/Serial Number KH537589

Processes

TIG (GTAW) Welding

Stick (SMAW) Welding

Flux Cored (FCAW) Welding

Air Plasma Cutting and Gouging

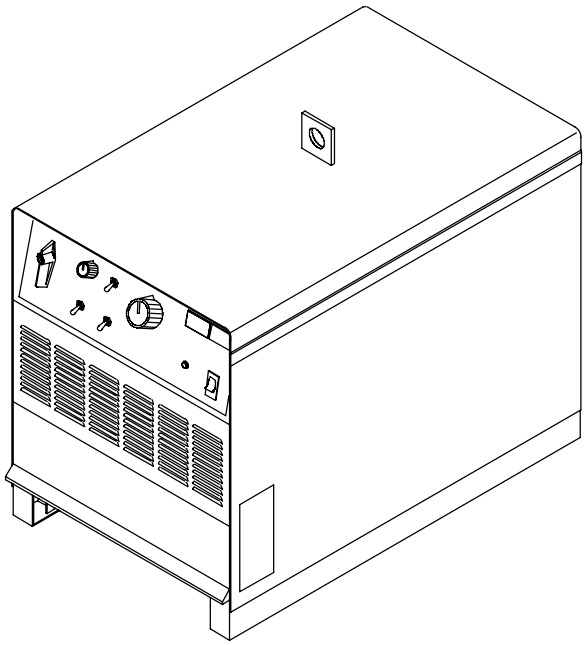
Air Carbon Arc (CAC-A) Cutting and Gouging

Description

CC DC 3 Phase

Arc Welding Power Source

Cyber Arc



302, 452, And 652 Models

OWNER'S MANUAL

Warranty

Effective January 1, 1997
(Equipment with a serial number preface of "KH" or newer)

This limited warranty supersedes all previous manufacturers warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, warrants to its original retail purchaser that new equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped from factory. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, manufacturer will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Manufacturer must be notified in writing within thirty (30) days of such defect or failure, at which time manufacturer will provide instructions on the warranty claim procedures to be followed.

Manufacturer shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to the distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Robots
   * Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
   * Motor Driven Guns (w/exception of Spoolmate 185)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * Orbital Weld Heads
   * Water Coolant Systems
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * SDX Transformers
   * Running Gear/Trailers
   * Field Options
     (NOTE: Field options are covered under the limited warranty for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts and Labor
   * MIG Guns/TIG Torches
   * Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts
   * Spoolmate 185

Limited Warranty shall not apply to:

1. Items furnished by manufacturer, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components; such as contact tips, cutting nozzles, contactors, relays, brushes, slip rings, or parts that fail due to normal wear.
3. Equipment that has been modified by any party other than manufacturer, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MANUFACTURER'S PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at manufacturers option: (1) repair; or (2) replacement; or, where authorized in writing by manufacturer in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. manufacturer's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at an authorized service facility as determined by manufacturer. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MANUFACTURER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MANUFACTURER IS EXCLUDED AND DISCLAIMED BY MANUFACTURER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

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Model Name **Serial/Style Number**

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Distributor

Address

City

State **Zip**

Resources Available

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Contact your Distributor for:	Welding Supplies and Consumables
	Options and Accessories
	Personal Safety Equipment
	Service and Repair
	Replacement Parts
	Owner's Manuals
	Circuit Diagrams
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PRINTED IN USA

CANOX

OM-222H November 1997

Eff. w/Serial Number KH537589

Processes

TIG (GTAW) Welding

Stick (SMAW) Welding

Flux Cored (FCAW) Welding

Air Plasma Cutting and Gouging

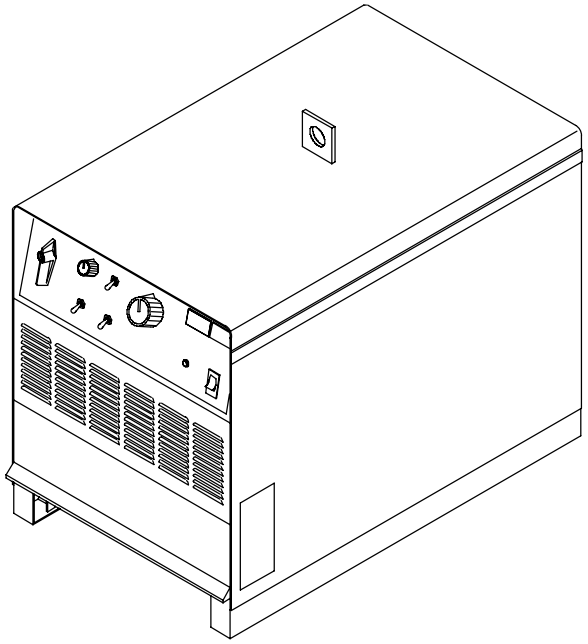
Air Carbon Arc (CAC-A) Cutting and Gouging

Description

CC DC 3 Phase

Arc Welding Power Source

C-GS 302, 452



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   * Water Coolant Systems
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * SDX Transformers
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PRINTED IN USA

WELDING INDUSTRIES OF AUSTRALIA

OM-222H November 1997

Eff. w/Serial Number KH537589

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TIG (GTAW) Welding

Stick (SMAW) Welding

Flux Cored (FCAW) Welding

Air Plasma Cutting and Gouging

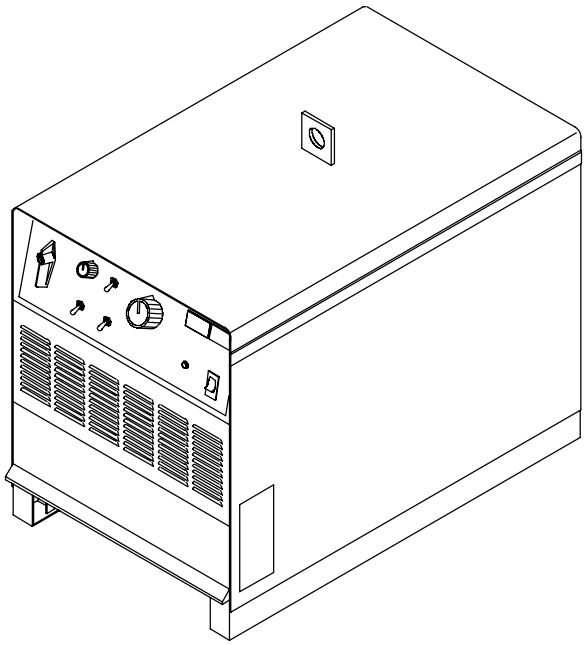
Air Carbon Arc (CAC-A) Cutting and Gouging

Description

CC DC 3 Phase

Arc Welding Power Source

Constructor DS40



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